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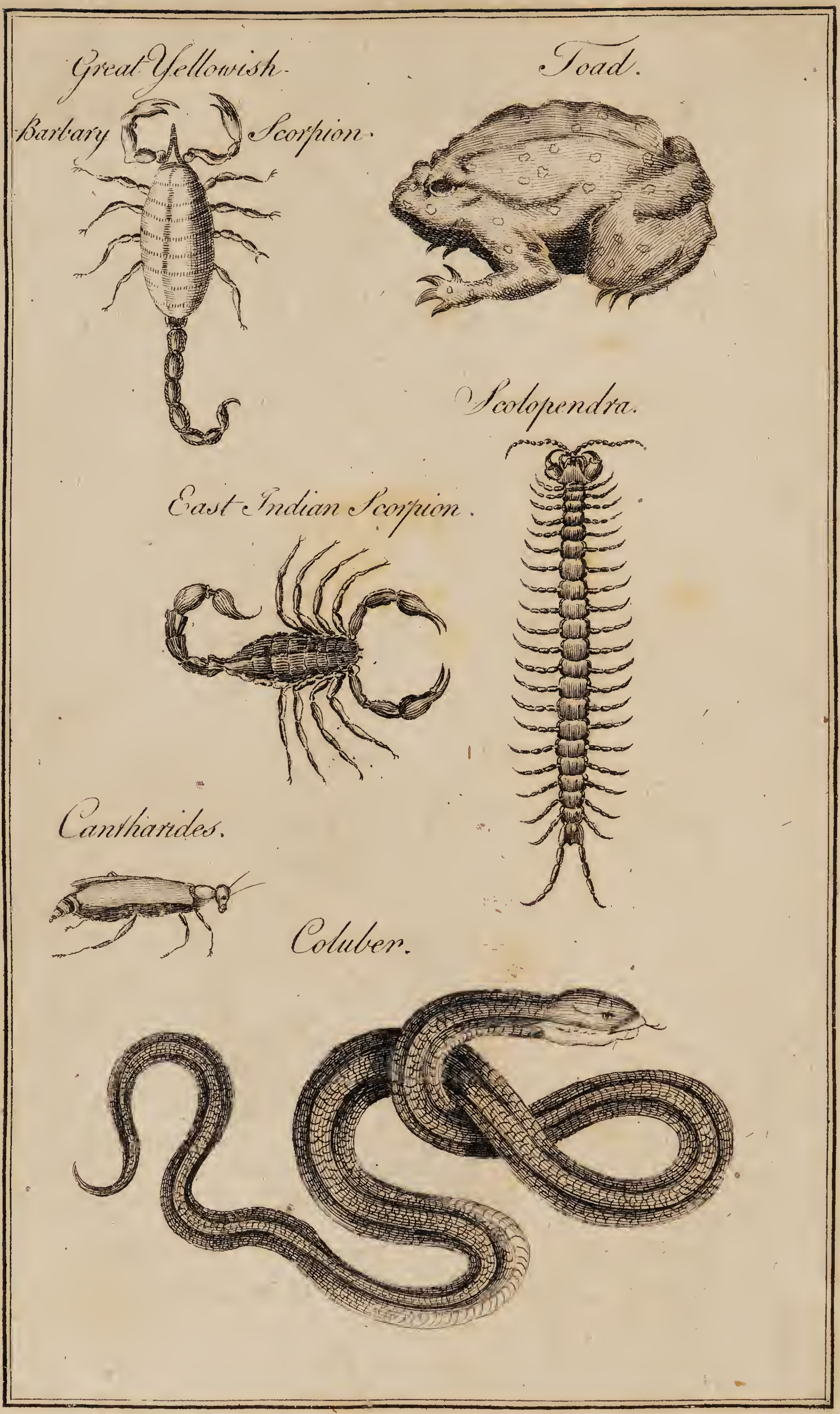
Great Yellowish
Barbary Scorpion
Toad.
Scolopendra.
East Indian Scorpion.
Cantharides.
Coluber.

Royce ſculp.

PRESTWICH'S DISSERTATION
ON
MINERAL, ANIMAL, & VEGETABLE,
POISONS;

Containing a Description of Poisons in General, their manner of Action, Effects on the Human Body,

AND

RESPECTIVE ANTIDOTES;

With

Experiments and Remarks on Noxious Exhalations from Earth, Air and Water.

Together with Several Extraordinary Cases,

AND

Elegant Engravings of the Principal Poisons of the Different Countries

Printed for F. NEWBERY: the Corner of St. Paul's Church Yard, LONDON.

1775.

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TO THE
RIGHT HONOURABLE
THOMAS DUCIE MORETON,
LORD DUCIE OF TORTWORTH,
In the County of GLOUCESTER, &c.

MY LORD,

THE liberty I have taken of prefixing your Lordſhip's name to this Work, proceeds wholly from the veneration I bear to your noble family, and from the deſire I have to teſtify my reſpect to your Lordſhip, the honourable deſcendant of it.

MY deſign in collecting and digeſting this ſhort Treatiſe upon Poiſons, which now ſolicits your Lordſhip's Patronage, was to put a check to the fatal effects of a diſeaſe, the moſt terrifying to human nature. If my endeavours ſhould be attended with ſucceſs, there is reaſon to hope, from your acknowledged candour, that I may be permitted to boaſt, in common with other benefactors to mankind, your Lordſhip's ſanction, which, ſhould I be fortunate enough to obtain, I ſhall eſteem it as one of the happieſt events of my whole life.

STRANGER as I am to the language of dedications, it would ill become me to attempt a diſplay of thoſe eminent qualities which add luſtre to your Lordſhip's elevated rank. Happy in the enjoyment of the public favour, may you long continue to reap the fruits of that ſelf approbation, which yields the trueſt ſatisfaction to a great and a liberal mind.

I am,

MY LORD,

Your LORDSHIP'S

Moſt obedient,

Humble Servant,

London,
1775.

JOHN PRESTWICH.

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A
TREATISE
ON
POISONS.

INTRODUCTION.

THOSE things, which are experienced to be in their whole nature, or in their moſt remarkable properties, ſo contrary to the animal life, as in a ſmall quantity to prove deſtructive to it, are called Poiſons: whether they are hurtful by being taken inwardly at the mouth, or communicated to the body externally by a wound.

" God made not death, neither hath he
" pleaſure in the deſtruction of the living,
" For he created all things, that they
" might have their being; and the genera-

“ tions of the world were healthful; and
“ there is no Poiſon of deſtruction in
“ them, nor the kingdom of death upon
“ the earth,” *Wiſdom of Solomon*, cap. i.
v. 13. As to this text, the meaning of it
is plainly this. “ God created nothing to
“ be deſtructive to mankind, but gave to
“ all things their proper nature; and the
“ productions of the world are wholeſome.
“ Even poiſons were not deſigned to be
“ hurtful, but for good uſes; for in all the
“ earth there are proviſions made againſt
“ death.”

The true ſtate of the caſe ſeems to be this. The productions of nature of this kind, as to us, are often medicinal, either in the external or internal uſe of them; and experience, improved by reaſoning, teaches us to prepare and apply them to various purpoſes: but they are alſo not only phyſic, but even food to ſome other animals, which, by natural inſtinct, devour them; and theſe themſelves afford not only good nouriſhment, but ſometimes remedies to us. Little inſects, which we think troubleſome, are neceſſary to the life of wholeſome birds and other creatures.

Goats and quails are fattened by Hellebore, ſtarlings by Hemlock, and hogs innocently eat Henbane; all which we call poiſonous—But this queſtion may, perhaps, ſeem more difficult with regard to poiſonous minerals: as for inſtance, Arſenic, which we find to be diffuſed almoſt through the whole mineral kingdom.

Now it muſt be obſerved, that this is not a perfect mineral, but an active ſubſtance, made uſe of by nature in preparing ſeveral metals in the earth, which are of great ſervice to man. It particularly appears to be ſo in the growth of ſilver, copper, tin, and lead; the ores of all which contain, beſides common ſulphur, a great deal of arſenic; ſo that this, in the language of the chemiſts, may be called a mineraliſing principle; and the caſe will be found to be much the ſame in all natural productions of this kind.

Before we proceed to particulars, it may not be improper to give a general idea of poiſons, to explain in what manner they act, and by what alterations made in our bodies they become ſo hurtful.

Now as to this, it will appear from what follows, that the poiſons are of different kinds, as well thoſe which kill by wounds, as thoſe which are taken inwardly; yet there is a great agreement in the manner of producing their effects: and that even *internal* poiſons exert their force in a manner analogous to the external.

Venomous animals, when they bite or ſting, inflict a wound, and inſtil into it a drop or more of liquor, which infects the fluid of the nerves, and by this means inflames the membranes: hereupon a ſwelling ariſes, ſometimes to a degree of mortification, which ſpreads to the neighbouring parts.

Poiſonous ſubſtances, being ſwallowed, wound the nervous coat of the ſtomach. An inflammation enſues, which, according as the Poiſon is of a greater or leſſer power, is communicated to the contiguous coats; and, in ſome caſes, eſpecially if it be of a mineral nature, ends in a perfect gangrene. For the difference between mineral and vegetable poiſons lies chiefly in this, that the former are of greater force than the latter.

But in all accidents of this kind, whether the wound be outward or inward, the miſchief does not ſtop at the part affected, but it is carried farther, even through the whole body.

This is effected by the great activity of the nervous fluid, one part of which being infected, immediately *taints* all the reſt: and thus the whole ſyſtem of nervous expanſions is drawn into ſpaſms and convulſions; which, according to the different offices of the parts to which the nerves belong, produce different ſymptoms.

In the ſtomach and inteſtines theſe ſpaſms cauſe ſickneſs, vomitings, and gripes; in the brain, deliria, ſleepineſs, and epileptic fits; in the heart, intermiſſions of the arterial pulſe, palpitations, and ſwoonings; in the lungs, difficulty of breathing, with ſtrangling and ſuffocations; in the liver, by the ſpaſmodic contraction of the biliary ducts, the bile is returned into the blood, and cauſes a jaundice; in the kidneys, the ſame diſpoſition of the urinary canals interrupts the ſecretion of urine, and makes it quite irregular. In ſhort, the animal œconomy is all diſturbed; and though different poiſons may ſhew their moſt remarkable effects in different parts, and theſe, according to the violence of the hurt, may appear in very different degrees; yet the ſymptoms always make it plain, that the firſt bad impreſſion is made upon the animal ſpirits.

Thus the firſt ſymptoms with which perſons are ſeized in peſtilential fevers, being faintneſs, giddineſs, palpitations of the heart, tremblings, &c. prove the nervous fluid is likewiſe principally affected in theſe diſeaſes; contagion being indeed a real poiſon, &c.

The cauſe of the Plague, is of ſuch a nature, that when taken into the body, it works ſuch changes in the blood and juices, as to produce this diſeaſe, by ſuddenly giving ſome parts of the humours ſuch corroſive qualities, that they either excite inward inflammations and gangrenes, or puſh out carbuncles and buboes; the matter of which, when ſuppurated, communicates the like diſeaſe to others.

OF THE

NERVOUS FLUID,

OR

ANIMAL SPIRITS.

AS the brain is manifeſtly a large gland, with a moſt exquiſite apparatus for the ſeparation of a liquor from the blood; this muſt, like all other glands, have an excretory duct: now the nerves are evidently contrived for this purpoſe, and conſequently muſt always contain a proper ſubtile juice. Therefore this fluid, ſo far as we can diſcover by its effects, is a thin volatile liquor, of great force and elaſticity; being indeed, moſt probably, a quantity of the univerſal elaſtic matter, incorporated with the fineſt parts of the blood, ſeparated in the brain, and lodged in the fibres of the nerves. This is the inſtrument of muſcular motion and ſenſation, a great agent in ſecretions, and indeed in the whole buſineſs of the animal œconomy.

By the univerſal elaſtic matter we may underſtand, that ſubtile and active ſubſtance, diffuſed throughout the univerſe, which Sir Iſaac Newton ſuppoſes to be the cauſe of the refraction and reflection of the rays of light, and by the vibrations of which light communicates heat to bodies; and which readily pervading all bodies, produces many of their actions upon one another.

It ſeems very reaſonable, from that uniformity, which there is in the laws of nature, to conclude, that the animal ſpirits are ſomething of this kind: for there can be no greater preſumption in favour of a ſcheme, than that it is ſimple; and of a piece with the known ſyſtem of the univerſe.

Now, an active ſubſtance of this kind in the nerves, muſt neceſſarily be very ſuſceptible of alterations from other bodies of extreme minuteneſs and great force: in like manner, as we ſee ſome chemical liquors, upon their firſt approach to each other, to fall into fermentation; the reſult of which is a compound mixture of a quite different nature, from what might have been expected from the ſingle ingredients.

Thus the compound ſpirit of nitre put to oil of cloves will efferveſce even to a flame: a fermentation being indeed no more than the attraction and repulſion of the particles of different bodies, when they come together.

By reflecting upon the phænomena, which the experiments of late years made upon electricity, have diſcovered to the world, and viewing the attraction and repulſion of the fineſt particles of electrical ſubſtances, any one may eaſily form an idea of this animal fluid, and of the exceſſive force and velocity with which it acts.

It is very obſervable, that the communication of electricity is much greater through animal, than through inanimate bodies; that is, the elaſtic fluid paſſing through theſe, meets with a greater quantity of the ſame matter in them than in the other: the ſolid animal fibres being more adapted to receive it.

The nervous fluid is endowed with great activity and force, and therefore capable of receiving various alterations from other bodies, eſpecially ſuch as conſiſt likewiſe of very ſubtile and powerful particles; and all poiſons we know are of this kind.

The effects of poiſons, eſpecially thoſe from venomous animals, are entirely nervous; for the ſuddenneſs of their miſchief is ſo quick on the animal ſpirits, that the bite of a rattle ſnake has killed a dog in leſs than a quarter of a minute.

As the different ſtate of the nervous fluid may, in ſome meaſure, alter their effects; ſo likewiſe theſe poiſons themſelves, though really of the ſame kind, may yet ſo differ in their force and degree of action, as to be hurtful in various and ſeemingly different ways.

It muſt be obſerved likewiſe, that although the firſt impreſſion of the poiſon be made upon the nervous ſpirit, yet the whole maſs of blood very quickly partakes of the hurt; not, as is ſuppoſed, from any mixture of the venom with it, but from ſuch a corruption of it, as an irregular circulation, interrupted ſecretions, and ſtagnations in the ſmalleſt veſſels, (the conſequences of a vitiated nervous fluid) may naturally produce. Nor will this ſeem ſtrange, ſince ſuch a compounded liquor, as the blood is, may certainly undergo any imaginable changes by alterations made in its motion only. Thus much concerning the general action of poiſons: in the following pages, I ſhall ſhew the particular actions of them, and afterwards the effects of the particular kinds of them.

OF FERMENTATION;

THE

MEANS BY WHICH IT ACTS UPON THE NERVOUS FLUID, AND THEREBY UPON THE WHOLE FRAME.

NOW, as we every day obſerve, that what is thrown out from liquors in a ferment, is capable of inducing the like motion in another liquor of the ſame kind, when duly mixed with it; ſo we may very well ſuppoſe, in the preſent caſe, that the ſaliva of a mad dog, which is itſelf one of the moſt fermentative juices in nature, being turgid with fiery ſaline particles, thrown into it out of the boiling blood, when it comes by means of a wound to be mixed with the nervous liquor in another animal, muſt neceſſarily put it into violent agitations, in the nature of a ferment, the conſequence of which will be all the effects of an interrupted ſecretion in the brain, and diſturbed circulation of the blood, viz. a fever, delirium, convulſions, &c.

The blood in this caſe is putrified in an extraordinary degree, and the inflammation runs ſo high, that it burns the ſkin; ſo that the peſtilent humours are bred in it, and quite conſume it.

The ſmoke of ſulphur, which by experience is found to abound with an acid ſpirit, and very penetrating, has alſo a powerful property in repreſſing fermentations, and may promiſe ſome ſervice in the caſe of the plague, &c.

OF

POISONS.

BY the word Poiſon, in medicine, is underſtood a malignant quality in ſome vegetable or mineral body, which renders it hurtful, and even mortal to thoſe who take it. There are three eſſential marks of poiſons, which diſtinguiſh them from other things that are noxious to human bodies. The firſt is, that they conſiſt of moſt ſubtile parts, and are conſequently pernicious in a ſmall quantity. The ſecond, that they in a ſhort time prevent the regular motions of the ſolids and fluids throughout the body, and induce the moſt grievous ſymptoms, and even death itſelf; and the third, that they exerciſe their cruelty on the moſt ſubtile fluids, and the moſt nervous parts.

Poiſons are of various kinds, and operate in various manners; ſome by diſſolving the blood, others by coagulating it; and others by corroding, and deſtroying the ſolid parts. All the three kingdoms have poiſons peculiar to themſelves; but the animal kingdom affords the moſt ſubtile, which are communicated by the bite of mad or venomous beaſts, when they are angered. The mineral kingdom produces arſenicals and mercurials; and the vegetable, *herbs* and plants of a moſt acrid, noxious and deleterious quality, ſuch as the moſt violent cathartics and narcotics. Some things will kill in a ſhort time which are not poiſons; as cold water drank plentifully when the perſon is in a profuſe ſweat; ſevere cold; a large quantity of brandy, or other ſpirituous liquors; and mineral ſpirits, as oil of vitriol.

Every ſort of poiſon ſeems to have an effect peculiar to itſelf; thus mercury attacks the fauces and their glands, producing ulcerations therein; arſenic occaſions the moſt cruel torments, convulſions, mortifications tification of the coats of the inteſtines: Litharge, unwarily taken, cauſes a convulſive cholic, with an obſtinate coſtiveneſs: *Milk*, mixed with *oil*, is an excellent remedy againſt all corroſive poiſons. Hoffman ſays, that he once prevented the death of ten young perſons, who had taken among them almoſt two ounces of arſenic in water-gruel, which, in a ſhort time, produced the higheſt anxieties, and corroding tortures, by *oil* of ſweet *almonds* and *milk*. They took at leaſt ten quarts apiece, which they vomited up again before the reaching to vomit ceaſed. The ſame author alſo affirms, that *milk*, in a large quantity, is an univerſal remedy againſt all poiſons that kill by inflammation, as Hemloc does; and, if taken in time, will prevent their dreadful conſequences *. Of the vegetable kingdom, are the ſeeds of Datura, a kind of ſtramonium, which induce madneſs or abſolute ſtupidity. Opium brings on ſleepineſs, and a torpor on the mind: the berries of deadly nightſhade, as alſo the roots of the cicuta-terreſtris, produce madneſs, rage, or folly. Hyoſcyamus cauſes a ſtupor, and ſo troubles the imagination, that the perſon affected believes he ſees dæmons and ſpectres: ſharp draſtic purges inflame the inteſtines. Of the animal kingdom, are the *bite* of a mad dog, which occaſions the dread of water: the venom induced by the ſting of a *tarantula*, produces wonderful effects; for the patient is delighted with muſical inſtruments, and when he hears their ſounds, immediately begins to dance; the ſting of a ſcorpion produces a ſudden chilneſs and exceeding cold ſweats.

---

* Vide Allen's opinion, folio.

MINERAL POISONS

ARE,

Cobalt, a ſingular ſpecies of arſenical ore.
Arsenic, white, yellow, and red.
Orpiment.
Quicksilver, diſſolved in acid mineral ſpirits.
Mercurials.
Corrosive Sublimate.
Copper Filings diſſolved in Vinegar.
Aqua fortis.
Vapours of Mineral Spirits.
White Vitriol.
Lead.
Litharge.
Cerussa, or white Lead.
White Lead diſſolved in Vinegar.
Glass of Antimony reduced into powder, &c.
Fumes of Lead.
--of Arsenical and Mercurial Minerals.
Mineral Spirits.
Oil of Vitriol, &c.
Smalt.

The mineral kingdom furniſhes very few real poiſons; the only natural one is cobalt: the factitious are, arſenic, corroſive ſublimate, and glaſs of antimony; the true orpiment is neither a yellow arſenic, nor a poiſon, it being void of all deleterious qualities; neither has it any draſtic qualities, either as a cathartic, or an emetic. Quickſilver, diſſolved in acid mineral ſpirits, is likewiſe a poiſon; though of itſelf it is entirely innocent; likewiſe glaſs of antimony, reduced into powder and exhibited, cauſes violent vomitings, with moſt cruel gripings, which often end in death, ſometimes in a few hours.

Arſenic taken inwardly creates a pricking, and burning ſenſation, with a heat and violent pain in the ſtomach, a racking torture in the bowels, vomiting, unquenchable thirſt, a roughneſs and dryneſs of the tongue, fauces, and gullet, with hiccoughs, then follow moſt cruel anxieties, palpitation of the heart, faintings, and a coldneſs of the extremities; ſometimes *black vomiting* and ſtools, with a fœtid, cadaverous ſmell; and a gangrene of the ſtomach and inteſtines, which uſher in death, if not timely prevented.

In all caſes where a perſon is ſuſpected to have been poiſoned by ſwallowing any ſubſtance of a corroſive nature, give, as ſoon as poſſible, large quantities of oil and milk mixed, quart after quart, till the reaching to vomit entirely ceaſes, and the patient gets eaſe.

Quere; in the royal navy, when milk cannot be procured, would not the *common* almond emulſion, or a decoction of marſhmallow root, be a proper ſuccedaneum, if at hand?

OF

COBALT.

COBALT (a ſingular ſpecies of arſenical ore) is a kind of marcaſite, which is found in great plenty in the mines of Miſnia; and is well known for its poiſonous quality, ſo fatal to inſects, brutes, and men.

In making the blue glaſs, or enamel, called Smalt, from this mineral, a ſort of white flowers ariſe, which being melted in a ſtronger fire, obtain the name of White Arſenic. If this be melted again with an additional eleventh part of ſulphur, it becomes yellow arſenic; and with a further ſixth part of ſulphur, red arſenic; of theſe the white is the moſt deadly poiſon.

OF

ARSENIC.

ARSENIC is a ponderous mineral ſubſtance, volatile, and inflammable, which gives a whiteneſs to metals in fuſion, and proves a violent corroſive poiſon. Arſenic is a moſt violent poiſon to all animals; unleſs the wolf ſhould be an exception, who is ſaid, probably without foundation, to be only purged by it. With regard to the effects of arſenic in the human body; a nauſea, ſickneſs, and reaching commonly enſue in half an hour after taking it, followed by violent vomitings, hiccups, and pains in the ſtomach and bowels; convulſions and palſies of the limbs preſently ſucceed, with intenſe heats, cold ſweats, palpitations of the heart, extreme anxiety, reſtleſſneſs, proſtration of ſtrength, thirſt, and dryneſs of the mouth and throat, loſs of reaſon, and at laſt death. If the quantity taken has been conſiderable, the ſtomach and inteſtines are often found, upon diſſection, corroded or perforated; though in general the patient expires before the action of the poiſon has proceeded to ſuch a length. There are many poiſons which act by coagulating the juices; but the operation of arſenic is erroneouſly ſuppoſed to be of this kind; arſenic rather liquifies, than coagulates the blood, and makes no change in its colour: it rather prevents than promotes the coagulation of milk, ſaliva, and other animal juices. It is better to acknowledge our ignorance, than to advance groundleſs conjectures.

Several ſubſtances have been propoſed as antidotes to this poiſon. If rock cryſtal, bezoar, or the *roots* of the elder tree, by ſome ſtrongly recommended, have ſeemed to do ſervice where arſenic had been taken; it was not on theſe ingredients, but on the oils or fats uſed along with them, that the good effects depended.

THE ONLY ANTIDOTES.

Oils, fats, warm fat broths, freſh butter, and milk, taken plentifully and repeatedly, are the only antidotes, both for obtunding the force of the arſenic, and promoting its diſcharge by vomit. If the vomiting does not freely ſucceed by the liberal uſe of theſe kinds of ſubſtances, ſome mild emetic muſt be added; the expulſion of the poiſon being a principal point. The more threatening ſymptoms being thus removed, oily clyſters, and a gentle laxative, are neceſſary to obtund and evacuate ſuch part of the arſenic as may have paſſed into the inteſtines; after which the ſtrength is to be recruited by proper analeptics (ſuch medicines as are proper for nouriſhing the body when weakened). Caſes frequently happen, in which gentlemen of the faculty are called upon to determine,

termine whether a particular ſubſtance be arſenic or not; as when powdery matters are found in the ſtomach of a perſon ſuſpected to have died by poiſon. Arſenic, in a ſolid form, may be diſtinguiſhed by its yielding in the fire, white fumes and a garlicky ſmell, and by its whitening copper. This laſt trial is moſt commodiouſly made, by placing a little of the powder betwixt two clear poliſhed copper plates, binding the plates firmly together with wire, cloſing the juncture all round with a good lute, and then heating them red-hot. We may try alſo, whether any reguline or ſemi-metallic matter is obtainable, by means of tartar and ſuet. White arſenic, or arſenic ſtrictly ſo called, is a moderately heavy, compact, hard, brittle concrete; of a cryſtalline or vitreous appearance, gradually changing, from expoſure to the air, to a milky hue, like that of porcelain; and at length to the opake whiteneſs of enamel. The large maſſes preſerve their tranſparency longer than the ſmall; in a dry, longer than in a moiſt air. In the fire, it neither burns nor perfectly melts; but totally and readily exhales in thick fumes, of a ſtrong fetid ſmell, reſembling that of garlick. The fumes, caught in proper veſſels, condenſe, either into cryſtalline maſſes again, or into a white powder, according as the receiver is more or leſs removed from the eath.

White arſenic has a milky whiteneſs, is gritty and inſipid; it ſwims on the ſurface of cold water like a pale ſulphureous film, but the greateſt part ſinks to the bottom, and remains there undiſſolved. If thrown on a red hot iron, it does not flame, but riſes intirely in thick white fumes, which have the ſtench of garlick, and cover cold iron, held juſt over them, with white flowers. Ten grains boiled in a gill of clear water, and then paſſed thro' a filter, I divided into five equal parts, and put into as many glaſſes—Into one I poured a few drops of ſpirits of ſalt armoniac; into another ſome of the lixivium of tartar; into a third, ſtrong *ſpirit* of vitriol; into the fourth, ſome *ſpirit* of ſalt; and into the fifth, a little ſyrup of violets. The firſt threw down a few particles of pale ſediment; the ſecond gave a white cloud, which hung a little above the middle of the glaſs; the third and fourth made a conſiderable precipitation of a lightiſh coloured ſubſtance, which in the former hardened into glittering cryſtals, ſticking to the ſides and bottom of the glaſs. The ſyrup of violets produced a beautiful pale tincture, &c. A mortification of the pudenda is peculiar to the poiſon of arſenic.

Yellow Arſenic is prepared by ſubliming white arſenic, with the addition of a tenth part of ſulphur. This is not ſo tranſparent as the white, but ſplendid, and very like to a metallic yellow glaze.

Red Arſenic differs from the yellow only in this, that a greater quantity of ſulphur is added, together with a particular kind of a red cobalt, called Kupfer Nickel.

OF

OF

ORPIMENT.

THE arſenic of the Greeks, Αρσενικὸν or Αρρενικὸν, was what the Latins named Auripigmentum, and we call Orpiment.

This is found in Greece and Hungary, in particular mines and veins, and is never mixed with any other mineral. It is of a foliaceous or laminated texture, and contains a great deal of ſulphur, as appears by its inflammability, and by its affording, when mixt with mercury ſublimate, a true cinnabar. By ſimple fuſion it runs into a maſs of a cinnabarine colour, called Sandarach. Then it yields a regulus, in every reſpect like to the regulus of true arſenic, yet it does not act as a ſtrong poiſon. Hoffman gave a good quantity of it to a dog, without its doing any harm. The reaſon of this is, becauſe its metallic particles are combined with ſulphur, and not with ſalt, at leaſt in any conſiderable degree.

All mineral poiſons bear ſome analogy to arſenic, and are more or leſs dangerous, according as their ſalts receive more or leſs force from the metallic particles. For this reaſon, as we have obſerved, that the moſt virulent may be mitigated by breaking the points of the ſaline cryſtals; ſo on the other hand, the moſt innocent minerals may become corroſive, by combining them with ſalts; as we ſee in the ſeveral preparations of ſilver, antimony, iron, &c.

This put Mead in mind of making a remark, which is both curious and uſeful. It is obſerved, that the fumes of lead are very noxious to thoſe who are conſtantly employed in melting it, as plumbers, caſters of ſhot, &c. It is found by experience, that this inconvenience did not attend the melting new lead, in any degree ſo much as it did the melting it when it was old;

for it is obſervable, that the workers in caſting new metal have never ſuffered in their health by it. This difference is aſcribed to the corroſive quality which lead acquires from the ſalts in the air, by lying long expoſed thereto.

For the fumes of minerals are only parts of the reſpective ſubſtances minutely divided; and therefore will not only produce ſuitable effects, but alſo in a more dangerous way; being not ſo much guarded againſt, and yet admitted farther into the body, that is, into the lungs, in reſpiration, as well as into the ſtomach, by means of the ſaliva; not to mention the impreſſion upon the ſpirits in the noſtrils, which muſt certainly be very conſiderable.

Mead mentions his having a clear liquor, which, though ponderous, was ſo volatile, that it would all fly away in the open air, without being heated; and ſo corroſive, that a glaſs ſtopper of the bottle, which contained it, was in a ſhort time ſo eroded, that it could never be taken out. The fume from it was ſo thin, that if a candle was ſet at ſome diſtance from the bottle, upon a table, the heat would direct its courſe that way; ſo that it might be poiſonous to any one that ſat near to the light, and to nobody beſides. It is ſufficient to the purpoſe to obſerve, that it was ſalt combined with metallic bodies.

OF

MERCURY,

OR

QUICKSILVER.

MERCURY, or Quickſilver, diſſolves in all mineral acids, but with different degrees of facility; and proves a menſtruum for ſundry metallic bodies.

Quickſilver, conſidered as a medicine, is a ſpecific againſt the *venereal diſeaſe*, *worms*, *lice*, and all kinds of *inſects*; the venereal diſtemper is not, perhaps, to be radically cured without it; but againſt inſects there are other remedies equally, if not more effectual. It has been commonly ſuppoſed to have of itſelf no poiſonous quality; but it appears, from experience, manifeſtly prejudicial to the nerves and the bones. Its ill effects are moſt obſervable, in thoſe who are expoſed to its *fumes*; which fumes are no other than perfect quickſilver, as any one may be convinced, by receiving them on a piece of moiſt leather or cloth; upon which they will reunite into little globules of mercury. Moſt people admit a pernicious quality in the fumes, tho' they deny it to exiſt in the quickſilver, not conſidering that the fumes are only the quickſilver itſelf, divided, but not altered by the heat. Even mercurial ointments, applied externally, have occaſioned contractions of the limbs, corroſions of the bones, and other dangerous conſequences. How ſoon do the miners feel its ill effects, though they are neither anointed with it, nor ſwallow it, nor are expoſed to the fumes into which it is reſolved by fire! They firſt become paralitic, and fall afterwards into a ſalivation: their teeth drop out; violent pains are felt in the whole body, particularly in the bones, and at length death enſues. The Spaniſh phyſicians treat ſuch patients in this manner; they expoſe them frequently for a conſiderable length of time to the open air, and give internally nothing but abſorbents.

Calomel ſeems to be the beſt and ſafeſt of the mercurial preparations that can be taken in a ſolid form. It may be given from five, to ten, or even twelve grains, in very robuſt conſtitutions; or, as an alterative, from one, to two or three grains.

Dr. Saunders aſſerts, that mercurial preparations are prevented from affecting the ſalivary glands, by the conſtant uſe of a ſolution of gum arabic in barley water, made in the following manner, viz. two ounces of gum arabic to a quart of barley water. It ought to be drank as common drink.

The exceſſive gravity alone of this mineral, however ſerviceable in other reſpects, may, if it happens to lie in any quantity in the interſtices of the nervous filaments, induce ſymptoms of dangerous conſequence, as ſpaſms, contractions, palſies, &c. which we find they commonly ſuffer, who have either been for a long time employed, in rubbing quickſilver upon looking-glaſſes, or in any work by which they are obliged to draw in mercurial fumes with their breath, or perſons who have been too much daubed with mercurial ointments, as ſhall be obſerved.

Experience has convinced us, that repeated doſes of crude mercury have in ſome caſes, even a conſiderable time after they have been taken, exerted their force, and thrown the body into unexpected diſorders.

I remember two accidents of this kind (and one of them proved fatal) in which, ſmall quantities having been given for many days together, a violent ſalivation enſued, more than two months after the uſe of it had been left off. And I ſaw a young lady, who having ſwallowed about ſix drahms every morning, for three ſucceſſive days, was ſalivated three weeks. The flux then ceaſed, but returned at the expiration of ſix months, and held a month; and once more came on, in the ſame manner, two months after. The breath was each time ſtrongly affected, as is uſual in mercurial ſpittings, ſo ſurpriſingly active is this mineral, even ſimple and uncompounded.

We may learn from hence, that it will be always right, in dealing with this ſlippery remedy, to take care that it has a free paſſage through the body, which muſt be done either by purging, or by combining it with ſubſtances, which will carry it off either by perſpiration or urine; for what is called alcaliſing it, does not deſerve the name of a preparation.

Now as to ſublimate, moſt certain it is, that the ſaline particles impart to the mercury a noxious quality; or, to ſpeak more properly, that the ſalt receives from the mercurial corpuſcles ſuch an increaſe of its gravity and momentum, as renders its cutting ſpiculæ more effectual and penetrating: the manner in which this matter is done, is probably this.

The component parts of the mercury, though ſo minutely divided by the action of the fire, as to riſe in the form of a fume, yet are ſtill ſolid and ponderous bodies; and by reaſon of their extreme minuteneſs, being perhaps ſimple and elementary corpuſcles, they will eaſily be lodged in the pores and interſtices of the ſaline cryſtals; which being compoſed of the atoms of ſalt, by ſublimation variouſly combined and united, are a kind of cutting lamellæ or blades; the force of which could never have been very penetrating, upon the account of their lightneſs and eaſy diſſolution, if the mercury, without blunting their edge, or breaking their figure, did not lend them an additional weight, and thus at the ſame time ſtrengthen their action, and prevent their quick ſolution by the juices of the ſtomach, which cannot now disjoin their component parts, becauſe the vacuities, into which they ſhould, in order to do this, inſinuate themſelves, are already poſſeſſed, and taken up by the mercurial globules.

In ſhort, theſe cryſtals, which are to be conſidered as ſo many ſharp knives or daggers, wounding and ſtabbing the tender coats of the ſtomach, and abraiding their natural mucus, will irritate the nervous fibres; upon which convulſions and vomitings, with exceſſive pains, muſt follow. And the blood veſſels being at the ſame time pricked, all the adjacent parts will be inflamed, and the blood ſtagnate; then come on ulcers, which, though ſingly ſmall, yet being many in number, do all together make up large gangrenes. This being the nature of corroſive ſublimate, it may not be amiſs to enquire how it comes to paſs, that this ſame compound, re-ſublimed with live mercury in the proportion of four parts to three (for the ſublimate will not take up an equal quantity) eſpecially if the operation be repeated three or four times, loſes its corroſiveneſs to that degree as to become not only a ſafe, but, in many caſes, a noble medicine.

Here then it is to be conſidered, that the action of the ſaline cryſtals depending upon their ſolidity and largeneſs, theſe neceſſarily muſt, by every ſubſequent ſublimation, be broken into ſmaller and ſmaller parts. The mercurial globules, riſing more quickly and eaſily than the ſalts, quit the interſtices in which they were lodged, and the cryſtalline blades are divided every time more and more by the force of the fire; whereupon a new combination of the parts ſucceeds. And although there be a greater proportion of the mineral to the ſalts than before, which makes dulcified mercury ſpecifically heavier than the corroſive, (for this contains two parts of ſalt, and one of mercury; whereas the dulcified, well prepared, has equal parts) yet the broken pieces of the cryſtals uniting into little maſſes of figures differing from their former make, theſe cutting points are now ſo much ſmaller, that they cannot make wounds deep enough to be equally miſchievous and deadly; and therefore only vellicate and twitch the ſenſible membranes of the ſtomach to ſuch a degree, as excites them to an excretion of their contents and glandular juices, upward or downward, according as the force of the irritation is greater or leſs.

Thus a violent poiſon is mitigated into a vomit or purge; nay, it may eaſily happen, (eſpecially in robuſt conſtitutions, and if the bowels be at the ſame time by any means defended againſt the ſtimulating power of the medicine) that this twitching may be ſo ſlight, as to be almoſt inſenſible, and hardly troubleſome. And then, the mercurial globules, being freed indeed from moſt of the ſaline parts in their paſſage thro' the primæ viæ, but ſtill having a mixture of ſome few of them, are quickly conveyed into the blood, where, by their motion and weight, they muſt neceſſarily diſſolve the preternatural coheſions of all the liquors, particularly of thoſe which circulate in the ſmalleſt canals, and are moſt viſcid and tenaceous, making them more fluxile and thin, or of more eaſy ſecretion.

Whereupon all the glands of the body are, as it were, ſet to work, and ſcoured of their contents; but the ſalival ones eſpecially, being many in number, very large and wide, and the juice they ſeparate of a tough and ropy ſubſtance, ſo that a conſiderable quantity of it is accumulated before it is forced out at the orifices of thoſe ducts, theſe effects will be moſt remarkable in them, and a ſalivation, or ſpitting, muſt continue until the active mineral particles are, through theſe, and the other paſſages, diſcharged out of the body.

We may alſo fairly conclude, from this reaſoning, that the ſafeſt way of raiſing a ſalivation is by *internal* medicines; ſince, whatever miſchiefs can be apprehended from theſe, may, in a greater degree, follow from the *external* uſe of mercury; not only becauſe, as we have already hinted, the mineral globules, being intimately combined with ſalts in the ſeveral preparations given inwardly, will, by the irritation of theſe, be eaſily and fully thrown out by the different emunctories, till the blood is quite diſcharged of its load; whereas, in all the daubings with mercurial ointments, we can never be certain, that none of the heavy particles are left lodged in the interſtices of the fibres, or cells of the bones; but alſo, inaſmuch as by computing the portion of mercury in all the doſes neceſſary to promote a ſpitting; and the weight of the ſame mineral, uſually applied, when this is done by unction; it will appear, that the quantity in the latter caſe vaſtly exceeds that in the former, and conſequently, that the inconveniences to be feared will be in the ſame proportion.

Therefore, this external management of quickſilver is chiefly to be recommended, where the conſtitution is not broken, or where ulcers and tumors require a particular cure, by liniments, &c. and a more thorough cleanſing of the body. And even in ſuch caſes, it will certainly be beſt to anoint daily with ſmall quantities, and not to raiſe a high ſpitting, but to promote the other ſecretions, particularly ſweating and urine, by drinking plentifully of thin liquors; and alſo, if there be occaſion, by laxative medicines; for it is well known, that cures are often wrought by theſe means, although the mouth has never been ulcerated by the mercury. At leaſt, this method will afford a temporary relief, and enable the patient to recover ſtrength; ſo that he may afterward, if it be neceſſary, undergo a more ſevere treatment.

It may be obſerved, that as the earlieſt uſe of mercury was in unguents and emplaſters, ſo moſt of the prejudices and outcries againſt it are owing to the effects produced this way. For the firſt attempts to cure venereal maladies by this remedy were learned from the Arabians, who having recommended mercurial ointments in the lepra or ſcabies, gave a handle to the Italian phyſicians to try their efficacy, in removing the foulneſs of the ſkin from a new and terrible contagion; neither were they ſparing of their liniments, which they continued to rub in for twelve, fifteen, nay ſometimes for above thirty days together; ſo that it is no wonder, if they often met with very untoward ſymptoms from ſo ſevere a treatment; and (as ſome of them affirm) now and then found mercury in the rotten bones of their patients, who had, it may be, ſuffered too much, both from their diſeaſe, and their phyſician.

There are many hiſtories of this kind; neither are inſtances wanting in living perſons, of mercury running out of the body, from a tumour, either ſuppurated, or opened by a cauſtic; nay, there is a caſe upon record, in which, upon opening a vein, ſome drachms of it flowed out with the blood.

OF

CORROSIVE SUBLIMATE.

THIS ſubſtance taken inwardly, produces violent gripings in the ſtomach and bowels, diſtenſion, vomiting, great heat, thirſt, cold ſweats, tremors, convulſions, inflammation, gangrene, and finally death.

ANTIDOTES

Give large quantities of milk, honey, and ſugar mixed, of warm water and oil, and add a ſcruple of ipecacuanha, to promote as quick a diſcharge upwards as poſſible, and throw up oily clyſters. When you have obtained a plentiful evacuation both ways, let the perſon drink very plentifully of barley water, with gum arabic, ſperma ceti, pulv. tragacanth. fat veal and mutton broths, milk, oil, &c. not forgetting to keep the body open for ſeveral days, in order to carry off the poiſon. Alkaline ſalts in moderate doſes, and frequently repeated, prove alſo ſerviceable, by ſeparating a part of the acid from the mercury, and thus blunting its ſpicula.

MEAD.

Corroſive Sublimate, is nothing but a mixture of quickſilver with common ſalt. For, though it is always prepared with nitre and vitriol added to the ſalt, in different ways, the beſt of which is that deſcribed by Tachenius; yet neither of theſe enter into the compoſition, ſerving only to facilitate the proceſs (which they do by uniting with the alcaline parts of the ſalt, and thus freeing its acid from them:) as abundantly appears from this experiment, that mercury ſublimed with the ſame proportion of nitre and vitriol, without ſalt, neither receives any increaſe of its weight, nor acquires any malignant quality.

The effects of this poiſon, when taken, are violent pains, with a diſtenſion of the belly; vomiting of a ſlimy, frothy matter, ſometimes mixed with blood, and ſtools of the ſame kind; an intolerable heat and thirſt, with cold ſweats, tremblings, convulſions, &c. as will appear from the following hiſtory, *Hippocrates Chymic.* cap. xxiv. To a large dog was given a drachm of mercury ſublimate, mixed with a little bread; within a quarter of an hour he fell into terrible vomitings, caſting up frequently a viſcid, frothy mucus, every time more and more bloody, and purged the ſame downward; till tired and ſpent with this hard ſervice, he laid down quietly as it were to ſleep, but died the next morning.

The abdomen being opened, a great quantity of extravaſated blood was found between the liver and ſtomach, and between the duplicature of the omentum about the ſtomach; the guts, as well as the ſtomach, were diſtended, and full of a frothy, bloody mucus: on the outſide they were of a livid colour, within all over red, and inflamed down to the very rectum. The fibrous coat of the ſtomach being taken off, between that and the nervous one, grumous blood was found in ſeveral places: the like was diſcovered here and there in the inteſtines, between the ſame coats.

The ſame ſymptoms with theſe, and manifeſt ſigns of a burning corroſion, followed with ulcers in the bowels, *Baccius de Venen.* pag. 21, obſerved in a young man poiſoned by ſublimate, mixed with his meat.

To this examination of the properties and effects of mercury, let me add, that there is another mineral poiſon, not very unlike it, either in its compoſition or action; this is arſenic, already treated of, which may be defined to be a volatile metallic ſalt; from the compoſition of arſenic we may readily underſtand the manner of its deadly operation, vide fol. 23.

It appears plainly, that the compoſition of arſenic is nearly the ſame as that of corroſive ſublimate; and as there the ſalts combined with the mercurial globules form cutting cryſtals, ſo here the metallic particles, which conſtitute the regulus, give a force and ſolidity to the ſaline bodies, which wound the ſtomach and guts; in like manner the others do, even to ſuch a degree as to cauſe mortifications.

Wepfer relates, that a dog having eat ſome fat, mixed with white arſenic, died the next day. The upper part of the ſtomach, when opened, was red and inflamed, the coats thinner than ordinary; the bottom of it was covered with a fetid ſlime, and ſome pieces of fat; the thin guts were ſo corroded, as to be pervious in three places; two of the ulcers ſo large that they would eaſily admit a bean: the cavity of the abdomen contained a yellowiſh ichor tinged with blood.

Leonardo di Capoa tells us of a child killed by the violent vomiting and purging, occaſioned from a ſlight wound made in the head by a comb wetted with oil, in which arſenic had been infuſed: for the pores of the body being opened by heat and exerciſe, ſome of the noxious effluvia might eaſily inſinuate themſelves into the part. Accordingly, Crato obſerved an ulcer of the breaſt cauſed by this application; Verzaſcha violent pains, and fainting fits; Diemerbroeck, and Dr. Hodges, death itſelf.

LEAD.

OF

LEAD.

THE effects of lead on the human body are dangerous to thoſe who are expoſed to its vapours in the fire, and even to thoſe who grind its *calx*, *minium*, *ceruſſe*, and *litharge*; for the painters are ſubject to violent gripes and conſtipations of the bowels, contractions of the limbs, and other diſorders. Much more hurtful is the internal uſe of lead, corroded or diſſolved by acids, as ceruſſe, ſaccharum ſaturni, or the ſalt of lead, the ſolution in vinegar, called acetum lithargyri, or the *tincture* drawn from the ſaccharum with ſpirit of wine, commonly called tinctura antiphthiſica. The ſaturnine preparations are applied externally with ſafety, as coolers, repellents, and deſiccatives; its calces, diſſolved in oils, form the baſis of moſt of the officinal plaſters. Culinary veſſels lined with a mixture of *tin* and *lead*, which is the uſual tinning, are apt to communicate to acid foods pernicious qualities, and require to be uſed with great precaution. An abuſe of this mineral has been extended to acid wines, which diſſolve ſo much lead, as to acquire a ſweet taſte, and then become ſlow poiſons.

CERUSSE,

OR

WHITE LEAD.

A SORT of calx of lead is made by expoſing plates of that metal to the vapours of vinegar. If when it is reduced into a fine powder, it is received in with the breath in inſpiration, and carried down into the lungs, it cauſes terrible aſthmas, that are almoſt incurable, and at laſt generally prove fatal: ſad inſtances of the very pernicious effects of this metal are too often ſeen among thoſe perſons who work lead in any form, but particularly among the workmen who prepare white lead.

If a room has been painted with white lead, and a veſſel full of water be let to ſtand in it for twenty-four hours, the ſaid water will contract a moſt poiſonous quality, which, if drank by any animal, will occaſion in them convulſions, and kill them in a few hours.

FUMES OF LEAD.

THE cholic from the fumes of lead, is a diſeaſe to which all workers in lead are ſubject, and is attended with an intolerable pain in the inteſtines, and a moſt coſtive body, the navel is drawn inward, there is the higheſt inquietude, and the contraction of the joints, attended with a *nauſea*, and a conſtant reaching to vomit, It is apt to terminate in a pareſis [a kind of palſy] or a ſpaſmodic aſthma, which afflicts the patient a long time. Theſe diſorders are ſometimes owing to the raſhneſs of medicaſters, in giving preparations of lead in the gonorrhæa and other diſtempers.

There is no better preſervative againſt this diſeaſe, than taking *fat broth* in a *morning*. The cure is to be attempted with *oleous clyſters*, and a *plentiful uſe of oil of ſweet almonds, or caſtor oil,* taken inwardly, with or without a *ſolution* of *man-*

na, by which the deſired end will generally be obtained. For the cure of the pareſis, bathing in freſh water is neceſſary; after which the ſpine of the bark muſt be anointed with a *liniment* made of the *fat* of a *hog*, expreſſed *oil* of *nutmegs*, *ol. hyoſciami*, *ſaffron*, and *oil* of *Roſemary*, which is a ſpeedy and a certain remedy.

This diſeaſe is called *Mill Reek*, by the miners at the *Lead-Hills* in *Scotland*, which all the inhabitants there are ſubject to; but melters of lead have it with the greateſt violence. In the ſlighteſt ſtage of it, there is an uneaſineſs and weight about the ſtomach, particularly near the cartilago enſiformis, and ſometimes it reſembles a cholic in the inteſtines. The ſpittle of the patient is ſweet, and inclining to a blackiſh colour, reſembling that of a perſon who chews lead. The pulſe is rather low, and the ſkin all over cold, with frequent clammy ſweats. The legs become feeble, with a pricking numbneſs, and the whole body is inert and enfeebled. Sometimes a ſpontaneous diarrhæa carries off the diſeaſe, but if it continues long it is very prejudicial. During this ſtage the patient is able to work.

When theſe ſymptoms continue long, and ſpirituous liquors are drank on an empty ſtomach, or after the working of lead, the *ſecond ſtage* comes on; and then there is a fixed pain in the ſtomach and guts, eſpecially in the lower part of the belly, extending from one hip-bone to the other, with an obſtinate coſtiveneſs, and a gnawing pain. The pulſe then becomes weak, and the ſkin hot. There is likewiſe a giddineſs and a violent pain in the head, which is ſucceeded by an inſenſibility, and a delirium of the worſt kind; for the patients bite their hands, and tear their own fleſh. Then their extremities tremble with convulſions, and at length they ſink with an intermitting pulſe, and die *comatoſe*, or *apoplectic*. The ſmoke or fumes of lead turn the adjacent graſs blue, hurt the water, kill birds in the air, beaſts in the field, and affect dogs in the ſame manner as they do men. Theſe laſt, when they cannot riſe, will tear up the ground they lie on.

If proper medicines are given in the firſt ſtage of the diſeaſe, the patient generally recovers. If it proceeds till the giddineſs comes on, the ſucceſs is doubtful; but, after that, it almoſt always proves mortal.

Thoſe who work in lead ſhould never go about their buſineſs faſting, and their food ought to be oily or fat. A glaſs of *ſallad* oil, with a little *brandy*, *rum*, or other ſpirit, is a good morning's draught; but ſpirits alone ſhould never be taken while at work, nor immediately after it. *Phyſic ſhould be taken Spring and fall*, and no man ſhould go into the cold air while hot with labour, and they ſhould change their working-cloaths for others as ſoon as poſſible. Liquid aliment is beſt, ſuch as *fat broth*, with good *meat*; for low living is bad. They ſhould now and then go a little way out of the tainted air. If the patient is plethoric, the cure is to be begun with bleeding, and then the primæ viæ muſt be cleanſed with a double doſe of *emetic wine*, or *emetic tartar*, otherwiſe it will have no effect. Such patients will even bear half a drachm of vitrum antimonii in fine powder, if plenty of *warm water* be drank during the operation. If the vomit works well upwards and downwards, the patient is in a fair way of recovery. And then a milder doſe of *ipecacuanha* muſt be given, with *emetic tartar*. If the doſe does not work either way, the patient is generally the worſe for it, and a ſtrong doſe ſhould be given ſoon after. If it vomits, but does not purge, an *antimonial cathartic*, or *jalap* and *mercury* ſhould be exhibited in a larger quantity than ordinary, and in the intervals between each doſe a table ſpoonful of caſtor oil; and then the patient ſhould drink plentifully of *warm broth*. The vomits and purges ſhould be repeated at proper intervals, till the diſeaſe diſappears. If they operate too much, an opiate may be given at night, but with caution, for fear of rendering the patient coſtive, which is the worſt thing that can befal him. When purgatives do not operate ſufficiently, *emollient*, *laxative*, and *anodyne clyſters* muſt be injected frequently, to empty the inteſtines. If blood and matter be voided with the fœces, emetics and purgatives muſt be forborne, till healing, balſamic, and laxative clyſters, with mild food, cauſe theſe appearances to ceaſe. When the belly is much ſwelled, emollient fomentations ſhould be often applied thereto. But if a delirium has come on, the patient ſhould be kept as quiet as poſſible during the little time he has to live. In ſome, when the complaint of the bowels has gone off, there is a pricking pain and feebleneſs of the legs, not unlike a rheumatiſm, and then they muſt be rubbed with coarſe cloth or a fleſh-bruſh. If that fails, embrocate the part before the fire with *nerve ointment*, mixed with *oil* of *turpentine:* when the pains are violent, and the feebleneſs reſembles a palſy, *bliſters* muſt be applied to the part over the large nerves, and medicines for the palſy muſt be given inwardly. If the patient is emaciated with a hectic, and troubled with a giddineſs in his head, talking oddly, he ſhould ride every day, and take *bitters* with the *bark* and ſteel; if the giddineſs continues, *myrrh pills*, with a ſmall proportion of camphire, are highly beneficial.

OF

ANTIMONY.

ANTIMONY, in natural hiſtory, is a blackiſh mineral ſubſtance, ſtaining the hands, full of long, ſhining, needle-like ſtriæ, hard, brittle, and conſiderably heavy.

Antimony has been by many eſteemed to be a poiſon. It is certain however that antimony, in its *crude ſtate*, is not a poiſon, but a medicine of great efficacy; and an excellent reſolvent and purifier of the juices, if given from four grains to half a drachm, along with abſorbents: it is capable indeed of being rendered, by various operations and additions, either truly poiſonous, or more medicinal, than in its crude ſtate; not but that its moſt virulent preparations may, by ſlight alterations in the mode of preparing them, be made ſalutary; and its moſt ſalutary ones *virulent*.

Antimony is not a pure ſemi-metal, but a ſulphurated ſemi-metal. When thrown into the fire, it burns with a blue flame, and emits ſulphureous vapours: on digeſting powdered antimony in aqua regia, the metallic part is diſſolved, and the ſulphur left behind. The ſulphur of antimony, purified from the metallic part, is perfectly the ſame as the common brimſtone of the ſhops, poſſeſſing the ſame properties, and anſwering the ſame purpoſes: if the ſemi-metal, freed from the ſulphur naturally mixed with it, be afterwards melted with common brimſtone, it reſumes the appearance and qualities of crude antimony.

Pure regulus of antimony, by whatever means obtained, is a light ſemi-metal, reſembling tin or duſky ſilver; without any thing of the blueiſh caſt of zink, or the yelowiſh one of biſmuth, about ſeven times ſpecifically heavier than water, moderately hard, entirely brittle, and of a ſparkling plated texture. If expoſed to a moderate fire, ſmokes copiouſly, and by degrees totally evaporates; by a gentle fire continued for ſome time it is changed into a whitiſh calx, which, on raiſing the heat, melts into a yellowiſh or reddiſh glaſs. Melted with ſilver or other malleable metals, it renders them hard and brittle. It deſtroys the magnetic power of iron, which other metallic bodies only weaken, in proportion to their quality. It does not amalgamate, or not without great difficulty, with mercury; if a mixture of it with ſilver and copper be reduced into fine powder, even thoſe metals will not, in that ſtate, be acted upon by mercury.

In the human body it acts as a virulent emetic and cathartic; and impregnates vegetable acids, as vinegar and acid wines, with thoſe virtues, almoſt inexhauſtibly. By ſulphur, and by calcination with nitre, its malignity is abated, and its emetic power changed into a diaphoretic one. As ſoon as it is reſtored to its pure metallic ſtate, it reſumes its virulence, which may be again deſtroyed, again reſtored, and almoſt infinitely varied.

Hoffman has given an account of the different medicinal effects of antimony, as depending on its different treatment. He obſerves, that crude antimony, on account of the regulus being corrected by the ſulphur, is not only ſafe, but in many caſes a medicine of great ſervice, both for man and other animals. That by ſimple fuſion it acquires a degree of malignity; but a far greater, if melted with half its weight of nitre, which conſumes nearly all the ſulphur, and leaves the regulus bare. That antimony, or its regulus, mixed with common ſalt, calcined over a gentle fire for ſeveral hours, and kept continually ſtirring and afterwards edulcorated with water, yields an aſh-grey calx, which is ſo fixed as to bear a melting heat, and proves a mild and ſafe diaphoretic, void of any malignant or emetic quality. That antimony, by calcination with a gentle fire in an earthen veſſel, in the open air, changes into a calx, which melts with difficulty, and which has no malignity. *But that if this calx be melted with a ſtrong fire into a glaſs, it becomes ſo active, that a few grains will occaſion a violent vomiting and purging, or even mortal convulſions and inflammations.*

That the powdered regulus, calcined in a glaſs-vial, placed in ſand for ſeveral days, becomes a greyiſh diaphoretic powder; *which reduced into a regulus by fuſion with powdered charcoal, nitre, and a little fat, proves again virulent.*

That when antimony is melted with one fourth its weight of ſalt of tartar, the whole poured into a mould, the *ſcoria* ſeparated, and the more ponderous matter pulverized, the reddiſh powder thus obtained is ſalutary; *but that when antimony is melted with three or four times its weight* *of ſalt of tartar, both the ſcoriæ and the regulus are virulent.*

That equal parts of antimony and nitre, melted together, yield a virulent maſs; but one part of antimony, with two or three of nitre, is an uſeful diaphoretic. *That on melting the diaphoretic calx with fat, charcoal powder and nitre, the virulent regulus is revived.*

And thus one preparation may be changed into another of very different virtues; a ſalutary into a poiſonous, and a poiſonous into a ſalutary one: different acids have different effects upon antimony; thus, whilſt the marine acid renders it either *corroſive* or *emetic*, the addition of the nitrous acid deſtroys the virulence, and renders the antimony mildly diaphoretic. All the antimonial ſulphurs are emetic and cathartic.

Glaſs of antimony. The glaſs may be eaſily made, by urging the calx in a crucible, with a ſtrong fire, and throwing in towards the end a little crude antimony or ſulphur: when the vitrification is compleated, the glaſs is poured on a copper plate, or on a flat ſtone. The glaſs of antimony is uſed only for making other emetic preparations, as the emetic wine, &c.

Glaſs of antimony reduced into powder, and exhibited, cauſes enormous vomitings, with moſt cruel gripes, which often end in death; and this Hoffman ſays, he has known it to do in a few hours.

Hepar antimonii, liver of antimony. Equal parts of crude antimony and nitre mixed together, ſet on fire and ſuffered to deflagrate in an iron mortar, which may be covered with a perforated plate; or injected by degrees into an ignited crucible, yield a liver-coloured maſs, called hepar antimonii, which, pulverized and edulcorated with water, is named crocus metallorum. *Two, three, or even one grain of either of theſe preparations, occaſion violent anxieties* *and vomitings;* though a dog will bear a dram, and a horſe a whole ounce, without being apparently any otherwiſe affected, than in having the alvine diſcharge increaſed.

The emetic wine, emetic tartar, and other medicines made from the glaſs, may alſo be made from the crocus.

OF

VENOMOUS EXHALATIONS

FROM THE

EARTH, POISONOUS AIR, AND STAGNANT WATERS, &c.

BESIDES theſe already treated of, there is yet another way of being poiſoned, and that is, by venomous ſteams and exhalations, or by a poiſonous air taken into the body by the breath.

This is notorious enough, and authors upon many occaſions make mention of it; but when they come to explain the particular manner how this virus kills, they moſt commonly reduce it to ſome of the poiſons, which prove deſtructive, by being admitted into the ſtomach; alledging, that malignant fumes and airs are fatal, becauſe impregnated with arſenical, mercurial, and the like hurtful particles, which they convey into the body; and, being of a very corroſive nature, muſt neceſſarily injure both the fluid and ſolid parts.

And indeed, that the fumes of theſe ſame minerals are very pernicious, and are filled with their atoms very unfit for reſpiration, is moſt certain; but to argue from hence, that all deadly vapours and malignant airs owe their miſchievous quality to theſe only, is too fond and ill-grounded a conceit; ſince, upon a due enquiry, it will appear, that there may be, and are, mortiferous exhalations from the earth, infecting the air, of a nature ſo different from any of theſe poiſons, that the very ſubſtance, from which they ariſe, may not be at all hurtful, if taken into the ſtomach itſelf.

Venomous ſteams and damps from the earth are not unfrequent, and tho' moſtly found in mines, pits, and other ſubterraneous places, yet they are ſometimes met with on the ſurface of the earth too, eſpecially in countries fruitful of minerals, or pregnant with imbowelled fires; ſuch are Hungary and Italy, the latter of which, as Seneca takes notice, has always been remarkable for them.

The celebrated Mofeta, a place about two miles diſtant from Naples, juſt by the Lago d'Agnano, in the way to Pozzuolo, or Puteoli, is commonly called la Grotta del Cani, becauſe the experiment of its deadly nature is frequently made upon dogs; though it is as certainly fatal to any other animal, if it comes within the reach of its vapour: for Charles the Eighth king of France proved it ſo upon an aſs; and two ſlaves put into it by order of D. Pietro di Toledo, viceroy of Naples, with their heads held down to the earth, were both killed. It is a ſmall grotto at the foot of a little hill, about eight feet high, twelve long, and ſix broad. From the ground ariſes a thin ſubtile, warm fume, viſible enough to a diſcerning eye, which does not ſpring up in little parcels here and there, but is one continued ſtream, covering the whole ſurface of the bottom of the cave; and has this remarkable difference from common vapours, that it does not, like ſmoke, diſperſe itſelf into the air, but quickly after its riſe falls back again, and returns to the earth; the colour of the ſides of the grotto being the meaſure of its aſcent, for ſo far it is of a darkiſh green, but higher only common earth, and this is about ten inches; and therefore, as I found no inconvenience by ſtanding in it, ſo no animal, if its head be kept above this mark, is in the leaſt injured. But when (as is uſual) a dog, or any other creature, is forcibly held below it, or by reaſon of its ſmallneſs cannot hold its head above it, it preſently, like one ſtunned, loſes all motion, falls down as dead, or in a ſwoon, and the limbs are convulſed and tremble, till at laſt no other ſign of life appears,

pears, than a very weak and almoſt inſenſible beating of the heart and arteries; which, if the animal be left there a little longer, quickly ceaſes too; and then the caſe is irrecoverable, as in one perfectly ſtrangled. But if the animal be taken out in time, and laid in the open air, it ſoon comes to life again; and the ſooner, if thrown into the adjacent lake, which, by conſtringing the fibres of the ſkin, in the manner of a cold bath, puts the blood again into circulation.

A lighted torch, is extinguiſhed in a moment, when dipped into the vapour. A piſtol cannot take fire in it. If a weather-glaſs be ſo fixed in the grotto, that the tube is wholly covered with the vapour, the quickſilver neither falls nor riſes otherwiſe than in the outward air.

In order therefore to underſtand wherein this deadly power conſiſts, it muſt be obſerved, that the uſe of reſpiration is twofold; the firſt, that the blood, in its paſſage through the lungs, may, by the elaſticity of the air, diſtending the veſiculæ, and thus preſſing upon the arteries, be comminuted and broken, ſo that no coheſion of its parts may hinder the ſecretion of thoſe humours, which in the ſeveral glands are to be ſecreted from it: the other is, that the blood may be ſupplied with ſomething from the air, whatever it be, neceſſary to life.

That there is a vivifying matter from the air, which paſſes into the blood by the breath; and that the ſame quantity of it will not ſuffice long for breathing, though it be deprived of none of thoſe qualities, by which it is fitted to inflate the lungs, and agitate the blood. The caſe being thus, ſince (as I have mentioned) the mercury in the barometer is not altered in its aſcent by this vapour, *i. e.* that there is no want of gravity and elaſtic preſſure in it, at leaſt to a conſiderable degree; we muſt conclude, that there is ſome quality in it, which, when it is drawn into the lungs, prevents and ſtops the uſual communication of the enlivening ſpirit from the air to the blood.

It is ſufficient to ſay, that there can be no real poiſon here. All that is diſcovered by the earth from which the fume ariſes, is no more, than that it is of a greeniſh colour, with a ſubacid taſte, very much like that of the phlegm of vitriol; ſo that it may very well be called an unctuous vapour of the vitriolic kind, raiſed by a ſubterraneous heat.

It is certainly neceſſary to the inflation of the pulmonary veſiculæ, and the ſubſequent entrance of the ſubtile matter from the air into the blood, that the nervous fluid ſhould have a free courſe into them; it is therefore highly probable, that theſe vitriolic particles in the fume have a counter-action or repulſive force to the elaſtic matter of this liquor; by means of which the fibrillæ, into which it ſhould paſs, being deprived thereof, become quite relaxed and loſe their force.

Neither ought it to ſeem ſtrange, that the animal ſpirits ſhould be ſo ſuddenly interrupted in their action, by the interpoſition of a ponderous fluid; ſince we ſee every day, how inſtantaneouſly, on the other hand, their motion is quickened and revived by the application of volatile ſalts to the noſtrils; and it may be obſerved, that theſe are always alcaline; that is, of a nature quite oppoſite to vitriolic or acid ſpirits, ſo as readily to fall into a conflict or fermentation with them. To conclude this part of our diſcourſe, I think it is a ſufficient confirmation of this reaſoning, that in frogs killed in this grotto, the bladders of the lungs (more viſible otherwiſe, and diſtinct in theſe creatures than in moſt others) were found quite ſubſided, and empty of air.

But if any one deſires a farther proof, he may, according to theſe principles, make, as L. di Capoa did, an artificial mephites: for if *antimony*, *biſmuth*, or any other ſuch mineral, be finely powdered and moiſtened with *aqua fortis*, or *ſpirit* of *nitre*; there will ariſe a great heat, with a thick dark ſmoke, in which, as in this grotto, torches are extinguiſhed, and animals, tho' but ſlowly, are ſtifled and killed.

The mortal effects of ſubterraneous damps, in mines, deep wells, and the like cloſe places; as alſo of the fumes of confined burning charcoal, may be accounted for in the ſame way; theſe being generally *acid* exhalations from mineral ſubſtances. And as in animals, which have died in the above deſcribed grotto, the veſicles of the lungs ſubſide, wanting their due tenſion from the animal ſpirits; ſo in the diſſection of a man killed by the *vapour* of *charcoal*, carried from a baker's oven into a deep cellar, as the ſtory is related in the Memoirs of the royal academy at Paris, the brain appeared dry, and the muſcles of the arms and thighs ſo relaxed, that they ſeemed ſeparated from the parts to which they belonged.

But it muſt here be obſerved, that, in ſome caſes of this nature, the mineral particles are mixed with ſo ſmall a proportion of water, that, inſtead of extinguiſhing a flame, they will themſelves, like gunpowder, take fire, and burn at the approach of a candle. Vide Phil. Tranſ. fol. 442. and an experiment, made by a mixture of *oil* of *vitriol* and *filings* of *iron*, confirms the truth of our reaſoning on this head.

Thus it is ſhewn how death may enter at the noſtrils, though nothing properly venomous be inſpired.

Hippocrates obſerved the conſtitution of the air, which preceded peſtilential fevers, to be great heat, attended with much rain and ſouthern winds; and Galen takes notice, that no other than a moiſt and hot temperament of the air brings the plague itſelf; and that the duration of this conſtitution is the meaſure of the violence of the peſtilence.

For it is a common obſervation in the Eaſt Indies, that during the dry heats the ſeaſon is healthful, but when the rains fall immediately upon the hot weather, then untoward fevers begin to threaten. It has been fully proved, that malignant and peſtilential fevers are owing to a viſcid and tenaceous lentor or ſlime, which firſt obſtructs the capillary arteries, and afterwards, being diſſolved by heat, ferments with the blood: and then this ſlimy mucus, being again taken into the circulation, in the nature of a ferment, diſturbs the whole maſs, and alters its natural properties.

It muſt indeed be owned, that ſome malignant fevers are contagious, and that contagion is a real poiſon: but the original cauſe of a diſeaſe, and the communication of it, are very different things. When a fever is communicated by way of infection from one already diſeaſed, this moſt commonly happens at the latter part of the diſtemper, that is (as in the hydrophobia) when the fermenting blood is throwing off great quantities of its active particles upon the glands of the moſt conſtant and eaſy ſecretions; ſuch are thoſe in the ſurface of the body, and in the mouth. Theſe therefore being by the air drawn into the lungs of a ſound perſon, and likewiſe inſinuating themſelves into the pores of the ſkin, will affect firſt the nervous fluid, and then the blood, and produce the like fermentation and diſorder, which had been bred in the body in which they were formed. The way by which bad food, ill ripened fruits of the earth, &c. often produce malignant and peſtilential diſeaſes, is not very different from that, by which we have obſerved unwholeſome airs to cauſe the like effects. For the juices with which theſe ſupply the blood, being corrupted, muſt neceſſarily make a fluid neither fit for nutrition, nor for the animal ſecretions; it is therefore no wonder, if, beſides the other ſymptoms, ſore puſtules, inflammations, ulcers, &c. (more common in fevers from this cauſe than in any others) are raiſed in the ſurface of the body.

Thus much concerning poiſonous exhalations and airs, ſo far as the conſideration of the grotta del cani has led us to enquire into their effects. For though there may be other alterations of this ſame element, differing in their nature from this we have inſiſted upon, and yet equally pernicious and hurtful; yet we take no notice of any of them, in regard that thoſe which proceed from arſenical, mercurial, and the like fumes, are reducible to a foregoing eſſay; and thoſe, which are owing to a change of the known properties of the air, may be eaſily explained, by what has been already ſaid in this chapter. I ſhall therefore mention the miſcief of another fluid, which, as it is the next in uſe to this, ſo the bad qualities of it, when it comes to be altered, muſt neceſſarily be almoſt equally fatal and dangerous.

I mean water, which is of ſuch conſtant uſe, not only for our drinks, but alſo in preparing of our fleſh and bread, that it may juſtly be ſaid to be the vehicle of all our nouriſhment; ſo that whenever this happens to have other properties than are neceſſary to fit it for this purpoſe, it is no wonder, if in its paſſage through the body theſe make ſuitable impreſſions there: for, let the groſs particles, with which the water is ſaturated, be of any other nature, as metallic, ſaline,&c. theſe, according to their various gravity, the capacity of the canals, and ſuch like circumſtances, will, when they come to circulate in the animal body, be by the laws of motion depoſited in one part or other.

For this reaſon, the choice of water for drink among the antients was by weight, the lighteſt being preferred, as moſt free from all heterogeneous bodies.

The reaſon therefore why ſome ſprings are poiſonous is, their having corroſive corpuſcles mixt with their water, which cannot fail, when forſaken by their vehicle, in the canals of the body, to do the ſame miſchief as they would have done, if they had been taken by themſelves undiluted; only with this difference, that they may in this form be carried ſometimes farther into the animal œconomy, and ſo having paſſed the primæ viæ, diſcover their malignity in ſome of the inmoſt receſſes. Thus the fons ruber in Ethiopia, mentioned by Pliny, about which abundance of native minium or cinnabar was found, ſhewed its ill effects chiefly on the *brain*: we ſhall not need to enlarge on this matter; ſince any of the forementioned mineral poiſons may thus impart their deadly quality to waters; and accordingly there are inſtances of arſenical, mercurial, &c. fountains, ſome of which

Baccius mentions, and a very remarkable one is taken notice of in the Philoſophical Tranſactions.

As to waters, there are ſome alterations of them, which, though not properly poiſonous, yet are of ſo great conſequence in their effects, that they very well deſerve to be regarded.

This I ſhall do with reſpect to a great abuſe, of this kind committed in ſome cities; and that is, in chuſing ſometimes ſtagnating impure well-water for the brewing of beer, and making other drinks. Such a fluid, indeed, has oftentimes a greater force and aptneſs to extract the tincture out of malt, than is to be found in the more innocent and ſoft liquor of rivers: but for this very reaſon it ought not, unleſs from mere neceſſity, to be made uſe of; this quality being owing to the mineral particles, and aluminous ſalts, with which it is impregnated.

Pliny tells us, "that thoſe waters are "condemned in the firſt place, which,

" when boiled, incruſtate the ſides of the " veſſels." And that our well-waters do this, no body who looks into the common tea-kettles can be ignorant.

Sanctorius teaches us, " that heavy " water converts the matter of tranſpira- " tion into an ichor, which being retained, " induces a cachexy."

OF

ACCIDENTS OR SYMPTOMS,

PRODUCED BY THE VAPOURS OF COAL, AND OF WINE AND OTHER FERMENTING LIQUORS.

NOT a ſingle year paſſes, without the deſtruction of many people by the vapour of charcoal, or of ſmaller coal, and by the *ſteam* or vapour of wine, &c.

Theſe ſymptoms occur, when ſmall-coal, and eſpecially when charcoal is burnt in a chamber cloſe ſhut, which is direct poiſon to a perſon confined in it. The ſulphureous oil, which is ſet at liberty and diffuſed by the action of fire, expands itſelf through the chamber; whence thoſe who are in it perceive a *diſorder* and *confuſion* in their *heads*; are affected with a *vertigo*, *ſickneſs* at the *ſtomach*, a *weakneſs*, *convulſions* and *tremblings*; and if they fail of preſence of mind, or of ſtrength, to get out of the chamber, *die* in a ſhort time. Tiſſot ſaw a woman who had vertiginous commotions in her head for two days, and almoſt *continual* vomitings, from her having been confined leſs than ſix minutes in a chamber (notwithſtanding both one window and one door were open) in which there was a chafing diſh with ſome burning coals. Had the room been quite cloſe, ſhe muſt have periſhed by it.

This vapour is narcotic or *ſtupefying*, and proves mortal, in conſequence of its producing a *ſleepy* or *apoplectic* diſorder, though blended, at the ſame time, with ſomething convulſive; which appears, from the cloſure of the mouth, and the ſtrong contraction or *locking* of the *jaws*.

The condition of the brain, after death, in perſons thus deſtroyed, proves, that they die of an apoplexy. Notwithſtanding, it is very probable, that ſuffocation is alſo partly the cauſe of their deaths; as the lungs have been found ſtuffed up with blood, and livid.

It has alſo been obſerved, in ſome other ſuch bodies, that patients, killed by the vapour of burning coals, have commonly their whole bodies ſwelled above one-third more than their magnitude, when living. The face, neck, and arms are ſwelled out, as if they had been blown up; and the whole human machine appears in ſuch a ſtate, as the dead body of a perſon would, who had been violently ſtrangled; and who had made all poſſible reſiſtance for a long time, before he was overpowered.

Thoſe who are ſenſible of the great danger they are in, and retreat ſeaſonably from it, are generally relieved as ſoon as they get into the open air; or if they have any remaining uneaſineſs, a little water and vinegar, or lemonade, drank hot, affords them ſpeedy relief. But when they are ſo far poiſoned, as to have loſt their feeling and underſtanding, if there be any means of reviving them, ſuch means conſiſt:

1. In expoſing them to a very pure, freſh and open air.

2. In taking ſome blood from the arm.

3. In putting their legs into hot water, and chafing them well.

4. The ſecond application ought to conſiſt in making them ſmell to ſome very penetrating odour, ſuch as the volatile ſpirit, or volatile ſalt of ſal. armoniac; and afterwards to ſurround them, as it were, with the ſteam of vinegar.

5. In making them ſwallow a large quantity of lemonade, or water and vinegar, with the addition of nitre. And,

6. In throwing up ſharp glyſters.

As it is manifeſt there is ſomething ſpaſmodic in theſe caſes, it is proper to be provided with ſome antiſpaſmodic remedies, ſuch as the mineral anodyne liquid of Hoffman.

A vomit will be hurtful; and the reachings to vomit ariſe only from the oppreſſion in the brain.

It is highly imprudent to ſleep in a chamber while either charcoal or ſmall-coal is burning in it; and the number of imprudent perſons who have never awaked after ſuch a ſtep, is ſo conſiderable, and ſo generally known too, that the continuance of this unhappy cuſtom is aſtoniſhing.

The bakers, who make much uſe of ſmall coal, often keep great quantities of it in their cellars, which frequently abound ſo much with the vapour of it, that it ſeizes them violently the moment they enter into the cellar. They ſink down at once deprived of all ſenſation, and die, if they are not drawn out ſoon enough to be aſſiſted, according to the directions juſt given.

The certain means to prevent ſuch fatal accidents is, upon going into the cellar to throw ſome flaming paper or ſtraw into it, and if theſe continue to flame out and conſume, there is no reaſon for dreading the vapour: but if they be extinguiſhed, no perſon ſhould venture in, till, after opening the vent hole, a bundle of flaming ſtraw, &c. has been ſet at the door, which ſerves to attract the external air ſtrongly. Soon after, the experiment of the flaming paper has been repeated, and if the flame ſtill goes out, more ſtraw is to be ſet on fire before the cellar door.

Throwing ſome ſalt on live coals, before they are put into a chamber; or caſting a piece of iron among them, to imbibe ſome part of their deadly narcotic ſulphur, is uſeful, yet not ſufficient to prevent all danger from them.

When the moſt dangerous ſymptoms from this cauſe diſappear, and there remains only ſome degree of weakneſs, of numbneſs, and a little inappetency, or loathing at the ſtomach, nothing is better than *lemonade*, with one *fourth part wine*, half a cup full of which ſhould frequently be taken with a ſmall cruſt of bread.

THE

FUMES

OF

FERMENTING LIQUORS.

THE vapour which exhales from wine, and in general from all fermenting liquors, ſuch as beer, cyder, &c. contains ſomething poiſonous, which kills in the like manner as the vapours of coal; and there is always ſome danger in going into a cellar, where there is much wine in the ſtate of fermentation; if it has been ſhut up cloſe for ſeveral hours. There have been many examples of perſons ſtruck dead on entering ſuch cellars, and of others who have eſcaped out of them with difficulty.

When ſuch unhappy accidents occur, men ſhould not ſucceſſively be expoſed, one after another, to periſh, by endeavouring to fetch out the firſt who ſunk down upon his entrance; but the air ſhould be immediately purified by the method already directed; or by diſcharging ſome guns into the cellar; after which with precaution people may venture in. And when the perſons afflicted are brought out, they are to be treated like thoſe affected with the coal vapour.

Tiſſot ſaw a man who was not ſenſible of the application of the ſpirit of ſal. ammoniac, till about an hour after he was ſtruck down, and who was entirely freed at laſt by a plentiful bleeding; though he had been ſo inſenſible, that it was ſeveral hours before he became ſenſible of a dangerous wound, which he had received in the fall.

EXHALATIONS

FROM

CAVES, &c.

WHEN ſubterraneous caves that have been very long ſhut are opened; or when deep wells are cleanſed that have not been emptied for ſeveral years, the vapours ariſing from them produce the ſame ſymptoms I have mentioned, and require the ſame aſſiſtance. They are to be cleanſed and purified by burning ſulphur and ſalt-petre in them, or gunpowder, as compounded of both.

The offenſive ſtink of lamps, and of candles, eſpecially when the flame is extinguiſhed, operates like other vapours, tho' with leſs violence, and leſs ſuddenly.

Nevertheleſs, there have been inſtances of people killed by the fumes of lamps fed with *nut oil*, which have been extinguiſhed in a cloſe room. Theſe laſt ſmells or fumes prove noxious alſo, in conſequence of their greaſineſs, which being conveyed, together with the air, into the lungs, prevent reſpiration. And hence we may obſerve, that perſons who have weak, delicate breaſts, find themſelves quickly oppreſſed in chambers or apartments, illuminated with many candles.

Let the patient be immediately carried into the open air, and let the air be fanned backwards and forwards to aſſiſt its action; let cold water be thrown on the face, and let the face, mouth and noſtrils be repeatedly waſhed; and as ſoon as practicable get the patient to drink cold water. But if the caſe is too far gone to be thus relieved, let a healthy perſon breathe into the mouth of the patient; and gently force air into the mouth, throat and noſtrils. Frictions, cupping, bleeding, and bliſters are likewiſe indicated. The ſteam of vinegar is alſo very ſerviceable in ſuch caſes.

OBSERVATIONS

UPON

AIR.

BY the word air, I do not mean the mere element ſo called, but the atmoſphere of the earth, which being compoſed of a great many various particles, may be hurtful or beneficial to us a great many ways. The different ſtates of the air, either for preſerving health, or repelling diſeaſes, are therefore daily to be obſerved.

Examples will elucidate this: a very dry and cold ſeaſon, during the continuance of a north or north-eaſt wind, contracts the whole habit of the body, ſtrengthens the fibres, renders the veſſels tighter and ſtronger, and thickens the fluids; moreover, it accumulates, and ſtrongly compreſſes the globules of the blood: in the words of *Celſus*, it ſtrengthens the whole body, and renders it more nimble and active; therefore, in the opinion of Hippocrates, the north-eaſt wind is of all winds the moſt wholeſome. But if ſuch a ſeaſon continues longer than uſual, the ſolids become too much contracted, and too elaſtic; and the fluids too thick, and very glutinous, ſo as to be unfit for paſſing along the ſmalleſt veſſels; for it not only brings a viſcidity upon the fluids, which endangers an inflammation, but likewiſe ſo much condenſes the red globules of the blood, as to make it difficult for them to pervade the extreme capillary ramifications of the arteries, becauſe, by being rendered harder than they ought to be, they cannot eaſily change their round figure into an oblong one, in order to render their paſſage the more eaſy; and as the capillary arteries are already contracted by the cold, they ſtrongly reſiſt any diſtenſion. From hence ariſe obſtructions, inflammations, pleuriſies, inflammations of the lungs, quinſies, rheumatiſms, and in ſhort all thoſe diſeaſes which proceed from a thick, viſcid, and inflamed blood, propelled by a very much increaſed force of the heart and arteries; for the more the veſſels are contracted by the cold, the more they are compreſſed by the weight of the atmoſphere, and the fluids contained in them move with a proportionably greater velocity, which cauſes a greater friction, and that a greater heat; which at laſt thickens and condenſes the blood to a very high degree. All theſe effects are certain and conſtant; for during this ſtate of the air, the blood taken even from a man in perfect health, is very thick, and for the moſt part glutinous; but much more ſo upon the approach of a fever.

This morbid viſcidity does not however come on all at once, but gradually after north-eaſt winds and a dry ſeaſon have long prevailed; and we are to obſerve not only what weather we have during this ſeaſon, but what ſort of weather has immediately preceded. But to men of a lax and phlegmatic habit of body, this ſtate of the air, ſo far from being hurtful, is extremely beneficial, bracing up their fibres, and rendering them more active and lively. Thus the winter agrees beſt with one kind of conſtitution, and the ſummer with another. Hence this ſeems to be the cauſe, that one ſpecies of epidemical fevers proves fatal to the ſtrong and robuſt, but favourable to the puny; whereas another, which is occaſioned by a moiſt and warm air, makes moſt havock among the latter. Therefore, from a great change in the atmoſphere, an epidemical diſtemper is either greatly changed, or altogether ſuppreſſed; as experience proves.

Now in order to guard againſt, and even to remove the evils of a dry and cold ſeaſon, we ſhould drink plentifully of diluting, emollient, and warm liquors, and uſe a mild moiſt relaxing diet; nor ſhould perſons ever venture abroad before they have drank ſomething warm, whether they travel on foot, or on horſeback, againſt theſe north-eaſt winds. And if any one finds himſelf rather indiſpoſed from this cauſe, and feveriſh, eſpecially if the diſorder is attended with a ſore throat, or a pain in the ſide, let him be immediately bled, and if the fever increaſes, the operation be repeated, as it is a certain rule, that phlebotomy is never more ſafe or ſucceſsful in acute diſtempers, than during a cold and dry conſtitution of the air, and when the barometer continues high; nor does this hold good only in pleuriſies and inflammations of the lungs; but alſo in many other diſeaſes, ſuch as the ſmall-pox, meaſles, rheumatiſm, cholics, &c. Nay, even in quotidian and tertian intermittents, the opening of a vein is extremely proper, otherwiſe they frequently bring on a continual ardent or inflammatory fever.

On the other hand, a moiſt warm ſtate of the atmoſphere relaxes the fibres too much, diminiſhes the force of the veſſels, makes the blood phlegmatic, ſluggiſh, and poorer than it ought to be, and renders the whole body ſpiritleſs, humid, languid, and diſpoſed to ſlow, putrid, long, intermitting fevers. Here, therefore, a quite contrary ſort of diet and medicine is to be made uſe of, viz. ſuch as will harden the ſolid parts of the body, preſerve the temperaments of the fluids, and ſtrongly compreſs the globules of the blood. That is to ſay, rough, cold, generous kinds of drink, a ſtrengthening, drying, aſtringent diet; the cold-bath, and other things of the ſame kind. As to fevers in this ſtate of the air, blood-letting is of very little uſe; nay, if freely uſed, it is very hurtful; for ſuch fevers ariſe from a weakened power of the heart and arteries, from a too lax texture of the blood, and from a ſluggiſhneſs in the fluids; hence ariſes a ſtagnation, and a liquid vital corruption; and this is the reaſon that ſlow, putrid, malignant, intermitting fevers are always the conſequences of ſuch a ſeaſon;

in the cure of which ſtrengthening remedies, and not ſuch as render the body feeble, are required. For very often, whilſt ſuch ſeaſons prevail, quotidian and tertian agues degenerate into long, very dangerous, continual putrid fevers, from which, if patients eſcape, they for the moſt part fall into the yellow jaundice, or a dropſy. And indeed they are never ſooner or more ſucceſsfully reſtored to health, than by a change of the atmoſphere to ſerene, dry, and clear weather, and, in conſequence thereof, the mercury's riſing high in the barometer.

This I have conſtantly obſerved, and the ſame was formerly taken notice of by that old and celebrated practitioner, Fred. Hoffman. Whereas ſuch patients very ſlowly recover, whilſt the cloudy and rainy ſouth-wind blows.

Moreover, a cold moiſt ſtate of the atmoſphere is not a little pernicious; for it injures us in a great many ways, but chiefly by inſinuating cold exhalations into the body, and highly obſtructing perſpiration: in ſuch a conſtitution of the air, we are then to wrap ourſelves up in warm cloaths, to keep a good fire, and, by a proper regimen, to guard as much as poſſible againſt theſe chilling vapours. In fine, we are by all poſſible means to promote perſpiration, amongſt which, frequent frictions of the whole body before the fire, with hot flannels or a fleſh-bruſh, contribute greatly to increaſe the cutaneous diſcharge, and conſequently to health, as does alſo daily exerciſe, and that even more violent than uſual.

Thus we ought always to combat, and guard againſt a peculiar intemperate conſtitution of the air.

OF

VEGETABLE POISONS.

Hemlock, common.
ditto ——— drop-wort.
Long-leaved Water Hemlock.
Napellus, or Monks-hood.
Night-Shade, deadly.
Black cherry Night Shade.
Egg —— —— ditto.
Mad —— —— ditto.
Drowſey —— ditto.
Pear-fruited —— ditto.
Rivina, or American ditto.
Datura.
Proliferous Datura.
Sensitive Plant, its branches.
Canadian, flat lemon-tree root
American Flea Plant.
Lanciniated Rudbeckia, or Canadian ſun-flowered Aconite.

Yellow Pyrenean Aconite.
Proliferous Mountain CROW-FOOT, or Portugal Crow-Foot.
Golden proliferous Crow-Foot.
Oriental meadow Crow-Foot.
Double white Crow-Foot
White Alpine, or great white Mountain Crow-Foot.
BLACK HELLEBORE.
Dark flower'd white Hellebore.
OPIUM, or the white Turkiſh POPPY.
COMMON LAUREL.
BITTER ALMONDS.
KERNELS of BLACK CHERRIES.
HENBANE or Hyoſciamus.
——— Seeds of ditto.
WOLF'S BANE, or Winter Crow-Foot.
GREAT DORONICUM, or Leopard's Bane.
Tree and Apple of the Manchenille.
THAPSIA, or deadly Carrot.
SOW-THISTLE.
The YEW-TREE.

Wild Cucumber.
Flea Wort, or Water Crow-Foot.
Coculus Indicus.
Nux Vomica.

The moſt dangerous vegetable poiſons are the true hemlock, wolfs-bane, the deadly night-ſhade, henbane, and datura; to which may be added the roots of hemlock-drop-wort; the common hemlock is ſo far from being poiſonous, at leaſt in ſmall quantities, that it has of late been found very efficacious in the cure of ſeveral moſt obſtinate diſorders. But hemlock, eaten inadvertently, has produced pains in the ſtomach and præcordia, with a ſenſe of pricking and heat therein, attended with giddineſs, a vertigo, epilepſy, and the abolition of the ſenſes, with a ſtrange ſhaking and diſtortion of the body; univerſal ſpaſms; a flux of blood from the ears; a ſwelling as big as ones fiſt at the pit of the ſtomach; hiccough, fruitleſs reaching to vomit; a ſwelling of the face and abdomen; and a flux of green froth from the mouth after death.

ANTIDOTES.

Allen thinks a vomit of warm water and oil, taken in large draughts, and often repeated, will be of great ſervice, or warm water, with freſh butter, as alſo milk and oil as beforementioned, or fat broths, which he alſo recommends, or any thing elſe which operates quickly; for other preparations only allow the poiſon to take deeper root, and therefore ought not to be waited for. If the above things will not provoke the patient to vomit, *oxymel* of ſquills, ſalt of vitriol, or a decoction of tobacco may be uſed, as having a more immediate effect, and the quicker the better; it is hardly ſafe to give even the moſt gentle cathartic: the ſtomach being thus emptied, recourſe muſt be had to generous wine, and alexipharmics; ſuch as Venice treacle, the bezoardic powder, confection of alkermes, the alexipharmic bolus, alexiterial draught. Diaphoretic cardiac, (in phar. mar. &c. &c.)

When there is a ſuſpicion that the coats of the ſtomach or inteſtines are corroded or ulcerated, it will be improper for the patient to uſe ſpices or vinegar, or to indulge in too much wine; but he ought to take a decoction of barley, with raiſins; or a decoction of china-root, ſaſſafras, &c.

The ſame method is moſt likely to anſwer, when any other deleterious herb or root has been eaten by miſtake, though the particular ſpecies ſhould not be known; and Hoffman affirms, that when the patient has been ſtupified by narcotics, the beſt remedies are vomits, mixed with oil, to facilitate the operation.

The moſt noted of the indigenous poiſonous plants are,

The CICUTA and ACONITUM.

The former is of two ſorts, our common hemlock, and the aquatica, which Ray calls cicutaria paluſtris tenuifolia.

What the cicuta, ſo much in uſe of old for poiſoning malefactors, eſpecially at Athens, was, we don't know: it is moſt probable, that it was not a ſimple but a compound. The hiſtory of the noble death of Socrates, related by his diſciple Plato, ſeems to evince it to have been a mixture of ſome anodyne juices with others of a corroſive nature.

Theophraſtus ſays, that Thraſyas, a great phyſician, had invented a compoſition, which would cauſe death without any pain; and that this was prepared with the juices of hemlock and poppy mixed together, and did the buſineſs in a ſmall doſe.

An extract of this kind might perhaps take away life with ſuch ſymptoms, as carried off this great philoſopher; viz. the eyes fixed, heavineſs and inſenſibility in the legs, and then great coldneſs in them, which by degrees ſeized the vital parts.

It is recorded of the people of Marſeilles, that anciently they had a poiſon kept by the public, in which Cicuta was only an ingredient; a doſe of which was allowed by the magiſtrates to any one, who could ſhew a reaſon why he ſhould deſire death.

OF

HEMLOCK.

CICUTA, or hemlock, is a tall umbelliferous plant, with large leaves, of a blackiſh green colour on the upper ſide, and a whitiſh green underneath, divided into a number of ſmall oblong, ſomewhat oval ſegments, which ſtand in pairs on middle ribs: theſe ſegments are again deeply cut, but not quite divided, on both ſides; and many of theſe ultimate ſections have one or two ſlighter indentations. The ſtalk is round, ſmooth, hollow, irregularly variegated with ſpots and ſtreaks of a red or blackiſh purple colour. The flowers are white, the ſeeds greeniſh, flat on one ſide, very convex, and marked with five furrows on the other. The root is oblong, about the ſize of a middling parſnip, yellowiſh without, white and fungous within. The plant is biennial; common about the ſides of fields, under hedges, and in moiſt ſhady grounds; and flowers in June and July. The leaves of hemlock have a rank ſmell, of that kind which is called *narcotic* and viroſe: they affect but little the organs of taſte. Taken internally, in no great quantity, this herb has occaſioned diſorders of the ſenſes, ſleep, convulſions, and in ſome inſtances death; and hence it is ranked among the poiſonous plants: Boerhaave tells us, that by the *effluvia* of the herb, bruiſed and ſtrongly ſmelt to, he became vertiginous. It is ſaid, that to certain brute animals it is innocent, and that its ill qualities are corrected by *vinegar*, or *other vegetable acids*.

The root of hemlock is generally ſuppoſed to be, both in external applications, and when taken internally, of more activity than the leaves. Storck relates, that on being cut, it yields a bitter acrid milk, of which a drop or two occaſioned a rigidity, pain, and ſwelling of the part, ſo as to prevent ſpeech; and that he was freed from this complaint, by waſhing and rubbing the tongue with *lemon juice.*

The cicuta aquatica, at leaſt in our colder countries, is much more violent than the other.

OF CICUTA-AQUATICA.

Long leaved water-hemlock is a poiſonous plant greatly reſembling *ſmallage*, growing in many meadows and watery places, for which it has been too often fatally miſtaken,

It differs from ſmallage in the leaves being long, ſlender, and deeply cut, commonly into three ſegments: thoſe of ſmallage are cut in the ſame manner, but the ſegments are ſhort and broad. The roots of this plant are at firſt hollow, and lined internally with a ſhining white matter; by age they become harder and more ſolid, and change their green colour to a pale yellow;

when full grown they are as large as the fiſt. They have a number of fibres, like the common celery root, eſpecially at the extremity, by which they are faſtened to the earth at the bottom of the water wherein they are commonly produced: they are often, however, looſened and carried off by the water; and too often have been taken up and eaten for celery, of which ſeveral melancholy inſtances have happened. Their poiſonous quality reſides in an orange-yellow juice, which is diſtributed indeed through the whole plant, but accumulated moſt plentifully in the roots.

Wepfer has, in a very learned treatiſe, deſcribed its deadly effects on ſome children, who by miſtake had eaten the roots of it. Theſe were, exceſſive pain and heat in the ſtomach; terrible convulſions, with the loſs of the ſenſes; diſtortion of the eyes; flowing of blood out of the ears; the jaws ſo hard ſhut that no force could open them; efforts to vomit, but nothing thrown up;

frequent hickups, with a great diſtenſion and ſwelling, eſpecially at the pit of the ſtomach; and when death had concluded the tragedy, a continued flux of green froth iſſued from the mouth.

Stalpart Van der Wiel gives the like account of two perſons killed at the Hague by the ſame roots.

In a dog, that, for experiment's ſake, was killed by this poiſon, the ſtomach, when opened, was found quite conſtringed, and cloſed at both orifices; its inward ſurface red, with livid ſpots here and there.

Thus it appears, that this plant conſiſts of hot, acrid and corroſive parts, which by rarifying the natural juices of the ſtomach, and hurting its nerves, are the cauſe of thoſe terrible diſorders, which have been deſcribed.

For, upon the ſenſe of a violent irritation and pain, the nervous fluid is, by the mind in a kind of ſurprize and hurry, determined in great quantities to the affected part, in order to throw off the cauſe of the diſagreeable ſenſation: which irritating the fibres of the ſtomach and muſcles of the abdomen, cauſes vomiting. But when the painful twitching is quite intolerable, the buſineſs is over-done; and the fibres are drawn into ſpaſms, which contract the mouth of the ſtomach, ſo that the noxious matter cannot be diſcharged, but is kept there in continued force and action. And by the communication of the infection through the nervous ſyſtem, the whole body quickly ſuffers, the blood-veſſels are torn and ruptured by the violence of the convulſions, and blood guſhes out from the ears and noſtrils, &c

This univerſal muſcular contraction was the reaſon, that one of the children, attended by Wepfer, made urine in the midſt of the agony, to the height of five or ſix feet, with a ſtrength and violence ſurprizing to the ſpectators. The caſe of the Aconitum is much the ſame. This is our Napellus or Monks-hood; and its effects ſo nearly agree with thoſe now related of the Cicuta, that I ſhall not need to recite them; the experiments of Wepfer are full and convincing.

HYOSCYAMUS OR HENBANE.

The flower is of the infundibuliform kind, conſiſting of one leaf, divided into ſeveral ſegments at the end. From the cup there ariſes a piſtil, which is fixed in the manner of a nail to the hinder part of the flower. This afterwards becomes a fruit, which is encloſed within the cup, and is like a pot or other veſſel with its cover, and is divided by an intermediate ſeptum into two cells, which contain ſmall ſeeds.

The roots having been eaten by a whole family (thro' miſtake) as parſnips, the ſymptoms produced were: thoſe who eat of them were ſeized with convulſions in a terrible manner, they were in general ſpeechleſs, but when they ſpoke they abſolutely raved; they had many of them the riſus ſardonicus, and all had their eyes ſtarting as it were out of their heads. The madneſs of them all continued ſo compleat, that it was uſeleſs to ſpeak to them, and the convulſions were ſo ſtrong, that five or ſix perſons were neceſſary to hold them, while they had the medicines poured down their throats; one of the boys eſcaping while they were giving the medicines to the reſt, ran into a pond, where he would have been drowned, if he had not been immediately taken out. The medicines given theſe people were,

TARTARUM STIBIATUM;

Forty-five grains in each doſe to the ſtrongeſt; and to the others

THERIACA, WITH SALT OF RUE.

They all recovered, but with great difficulty, and with very odd ſymptoms at the going off of the heavier effects of the poiſon. The next day they had all recovered the uſe of their reaſon, but had not the leaſt remembrance of any thing that had happened; and all this day every object that they viewed appeared double to them; the next day this ſymptom was removed, but in the place of this there came on another in the ſame organ, every thing they ſaw now appearing red as ſcarlet. This ſymptom gradually went off afterwards, and they found themſelves perfectly well. Phil. Tranſ. No. 450. p. 449.

SEEDS of the COMMON HENBANE.

The ſeeds of the common henbane produce intenſe thirſt. ravings, dimneſs of ſight, and a profound ſleep, which may laſt for two or three days: for which the following is the antidote.

Bleeding, bliſtering, purging and vomiting, will recover the patient.

OF THE

NIGHTSHADES

BLACK CHERRY NIGHT-SHADE, EGG NIGHT-SHADE, MAD NIGHT-SHADE, DEADLY NIGHT-SHADE, DROWSEY NIGHT-SHADE, PEAR FRUITED NIGHT-SHADE, AND RIVINA OR AMERICAN NIGHT-SHADE.

THIS plant is called, Solanum Melanoceraſos, ſolanum maniacum, and ſolanum lethale. Black cherry night-ſhade, mad night-ſhade, and deadly night-ſhade.

Tournefort juſtly ſeparated it from the ſolanums by the name Belladonna; and Linnæus, who preſerves the diſtinction, diſcarding that unſcientific term, has called it Atropa. He adds, as the diſtinction of the ſpecies, caule herbaceo foliis ovatis integris: herbaceous atropa, with oval undivided leaves; theroot is long, thick, and brown.

The ſtalk is a yard high, purple at bottom; of a pale green upwards; thick, hairy, and divided into a few branches.

The leaves are numerous, and placed irregularly; they are oblong, broad, not at all indented at the edges; of a faint green, and hairy.

The flowers are very numerous, and ſingular in their aſpect. They riſe from the boſoms of the upper leaves, and are hollow, oblong and large; of a duſky greeniſh colour, ſtriated and ſtained in various degrees with a dull purple.

The baſe within is yellowiſh, and the upper part purple.

Theſe flowers are ſucceeded by large beautiful gloſſy berries, of a fine jet black, and the cup of the flower remains with them.

This cup is formed of a ſingle leaf, divided deeply into five ſegments.

The body of the flower is formed of a ſingle petal, tubular and ſmall at the baſe, ſwelled and hollow in the body, and at the edge divided into five little waved ſegments.

In the hollow of the flower are placed five filaments and a ſingle ſtyle: the filaments converge at their baſes, and ſpread out to the top, and they have large doubled buttons; the ſtyle is ſlender, and a little bent, as they are: it riſes from a roundiſh rudiment of the berry, and is crowned with an oblong head, placed tranſverſely; the *berry* contains ſeveral kidney-ſhaped ſeeds.

The five filaments and ſingle ſtyle plainly refer the plant to the pentandria monogynia, the fifth claſs in the Linnæan method, and its firſt ſection.

CULTURE OF THE ATROPA.

It grows wild in theſe kingdoms, and conſequently will be hardly in our gardens. The root is perennial, and the berries ripen freely; it may be propagated by parting the one, or ſowing ſeeds from the other; it thrives well in a deep mellow ſoil. Care is required to cut down the ſtalks before the ripening of the berries, for they have a tempting look to children; and, if eaten, will deſtroy them. This plant is poiſonous, and is therefore capable of deſtruction. Many have periſhed by it.

Of the Uſe of DEADLY NIGHT-SHADE.

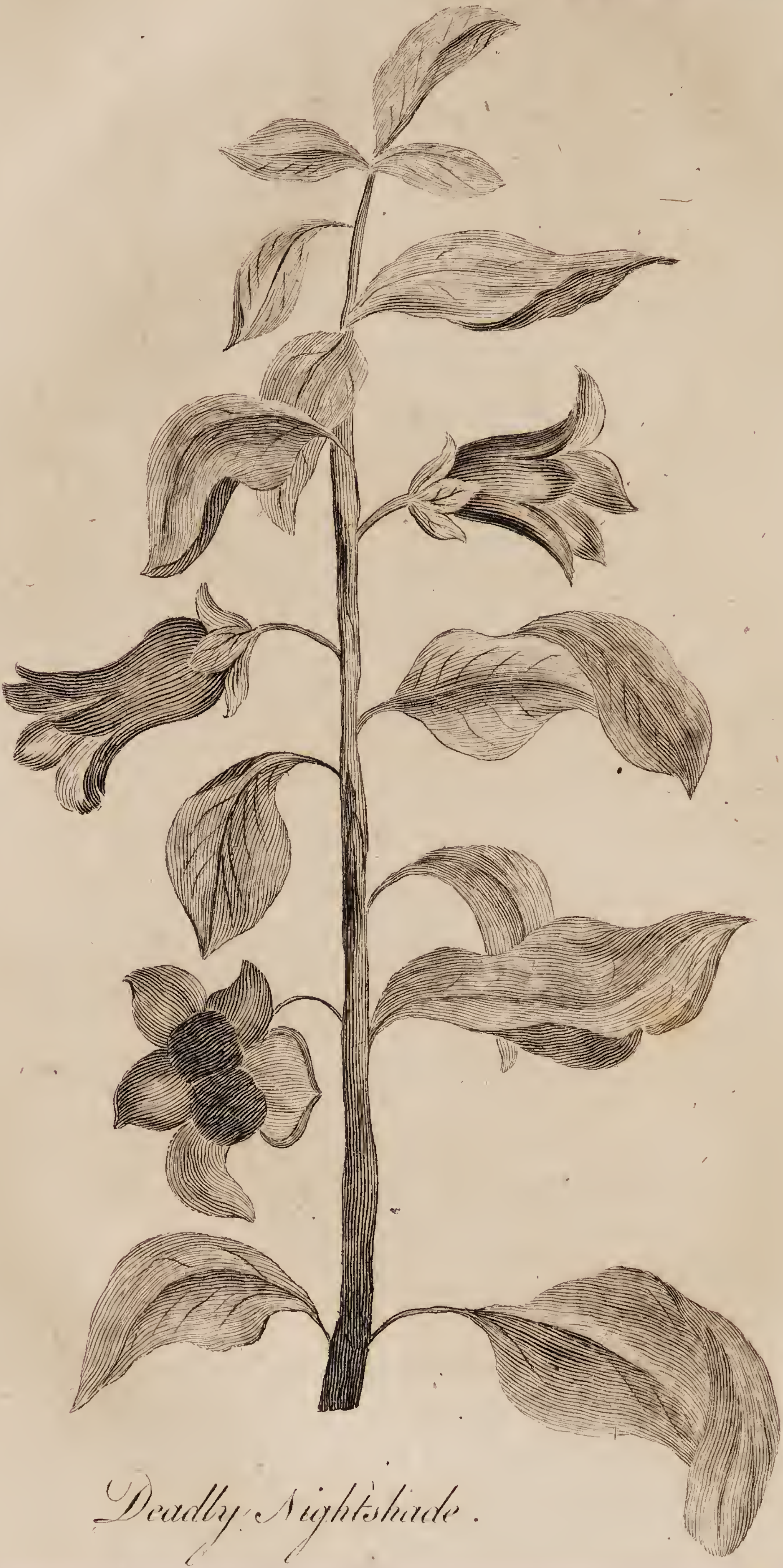
The antients ſpeak of a ſolanum maniacum, or ſolanum furioſum, ſo named from its effects in producing a *temporary madneſs*. They have been underſtood to mean this plant; but there commentators have erred. Mathiolus is with reaſon to be excepted from this cenſure; for he judged more truly, that it was unknown to them.

Their ſolanum, whoſe name was ſimply the word ſtrychnos, had in a ſmaller doſe the effects of *inebriation*; in a larger quantity it cauſed *madneſs*; and in a yet larger death. Thus much Theophraſtus ſays of it. *A drachm of the root given in wine, produced the leſſer effect, two drachms brought on the greater, three drachms occaſioned madneſs for life, and four were fatal.* This is the account given by the father of natural knowledge; and this Dioſcorides, and thoſe who followed him, tranſcribed, adding, or altering ſlightly, according to their particular opinions. From theſe Greeks the Romans took their accounts. Pliny has jointly uſed the words of Theophraſtus and Dioſcorides; and moſt later writers have copied Pliny. Hence we have the hiſtory of the Greek Strychnos, and its *intoxicating* quality, which they called Strychnomania, the *madneſs* of *Solanum:* and which modern writers have attributed to the deadly Night-ſhade. The ancient Greeks knew of three night-ſhades: the garden kind, which they held innocent; the ſonniferous, which brought on *drowſineſs*; and the *furious* or mad night-ſhade, whoſe root in various doſes occaſioned thoſe different effects. They aſſert, that a drachm of the root of the ſolanum furioſum might be given with ſafety; *but a few grains of that of our deadly night-ſhade have been found fatal.*

The deadly night-ſhade therefore is not the ſolanum furioſum of the antients; nor do their deſcriptions of that plant agree with it: for that had leaves like the *rocket* or acanthus, and cluſtered berries, as the ivy. The deadly night-ſhade does not appear to have been known to them; but it poſſeſſes the ſame qualities in a ſuperior degree; *a grain of it being equal in effect to a drachm of their ſtrychnos.*

It is capable of bringing on the ſtrychnomania, or night-ſhade madneſs; and when taken inadvertently, is fatal.

On



Deadly Nightshade.

J Royce Sculp.

An infuſion of half a grain of the leaf cauſes vomiting, purging, and ſweats.

Effects of this Solanum from the London Magazine for September, 1747.

The following melancholy accident happened at Edinburgh: ſome boys and girls going into a garden where nightſhade grew, and ſeeing its beautiful black berries, eat ſeveral, not knowing their poiſonous quality: in a ſhort time they ſwelled, and were thrown into ſtrong convulſions: next morning one died, and another in the evening, though all poſſible care was taken of them.

Deſcription of the PLANT.

“ Solanum Lethale, or Deadly Nightſhade, grows wild in ſeveral places, ſuch as about ruinous ſtone dykes or hedges, old buildings, in woods or parks, and in gardens; it riſes ſometimes to the height of a man, but uſually not above three or four feet, having round green ſtalks ſet with divers large leaves, ſmooth, and green, ſet upon very ſhort foot-ſtalks, among which, at the joints with the leaves come forth ſeveral long hollow flowers, indented at the brims, of a faint, deadiſh purple, ſtanding in a green huſk, which, after the flower is fallen, contains a great, round berry, green at the firſt, but about September, when ripe, is of a beautiful ſhining black colour, like poliſhed jet, full of a purple-coloured juice, and containing very many whitiſh kidney-ſhaped ſeeds."

Caſe of two BOYS poiſoned with eating the BERRIES of NIGHT-SHADE; by Doctor RICHARD LAMBERT.

On Tueſday morning, September 24, 1771, a man from Newburn, in Scotland, in great diſtreſs, deſired me to viſit his two children, the eldeſt ten years old, the other eight, who the day before had eat of the berries of the deadly nightſhade; I ſaw them at eleven o'clock, and found two fine healthful boys in a very melancholy ſituation; the elder lying in bed *delirious*, and apparently in a *dying* condition, with ſtrange convulſive geſtures; the younger ſtanding at his mother's knees, in his ſhirt, inſenſibly rolling his eyes, involuntarily ſtretching out his arms, and every now and then ſeeming to pick up ſomething with his fingers, which having thought he had caught, he carried to his mouth, as if he had meant to eat it*; moſt probably the idea of the berries ſtill remained in his diſturbed imagination.

Upon examining the particular ſtate of the caſe, I found that the boys, the day before, had rambled in queſt of black-berries, hips, haws, or other ſuch fruits, as the children of poor villagers uſually ſeek for at this ſeaſon of the year; that unfortunately they had found this plant, and eat of its berries, as nearly as can be aſcertained about three o' clock in the afternoon. At ſix in the evening, the elder child began to loſe his ſpeech, as if drunk; the ſame ſymptoms appeared in the younger, at nine, and both continued the whole night unruly, and were with difficulty held in bed.

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* Atropa, belladona, ſolanum lethale, deady nightſhade, or dwale.

Both the children's eyes were amazingly affected; the whole circle of the lucid cornea appearing black, the iris having retracted itſelf ſo entirely, as not to leave the leaſt veſtage of the pupil; the *tunica* albuginea as red as it is often ſeen in a phrenzy: theſe appearances, accompanied with a remarkable kind of ſtaring, added to the other circumſtances, exhibited a truly affecting ſcene. It would ſeem as if this poiſon, in a very peculiar manner, affects the eyes.

From ſuch an imperfect account as the poor man was able to give, it ſeemed difficult to determine at once what might be neceſſary to do upon the occaſion; ſo I gave him a common oily emulſion, and ordered him to give each of the children two table ſpoonfuls frequently, till I could viſit them, when I carried with me four papers of vitriol alb. two with fifteen grains in each, the other two with ten grains in each paper; as I found the children had not vomited after eating the berries, I gave the ſtronger (and then the younger) one of the papers with fifteen grains, which ſoon made him ſick and puke; nothing was diſcharged but a little bile, with froth, and ſome of the emulſion; the elder afterwards was given the other two powders, at proper diſtances, and preſently threw up the ſame ſort of ſtuff. Glyſters, made of the materials at hand, were now directed to be injected frequently, in order, as far as might be, to ſollicit an evacuation by ſtool, till proper purgatives could be procured, on which (as nothing of conſequence had been diſcharged by the vomits) my whole hopes reſted. I therefore ordered *two table* ſpoonfuls of the following purgative.

Take of Senna leaves bruiſed three quarters of an ounce; cream of tartar one drachm and an half, apothecaries weight; caraway ſeeds bruiſed the ſame quantity. Boil the cream of tartar in half a pint of water till it is diſſolved; then pour the water, while boiling, upon the other ingredients, and when cold ſtrain off the liquor for uſe.

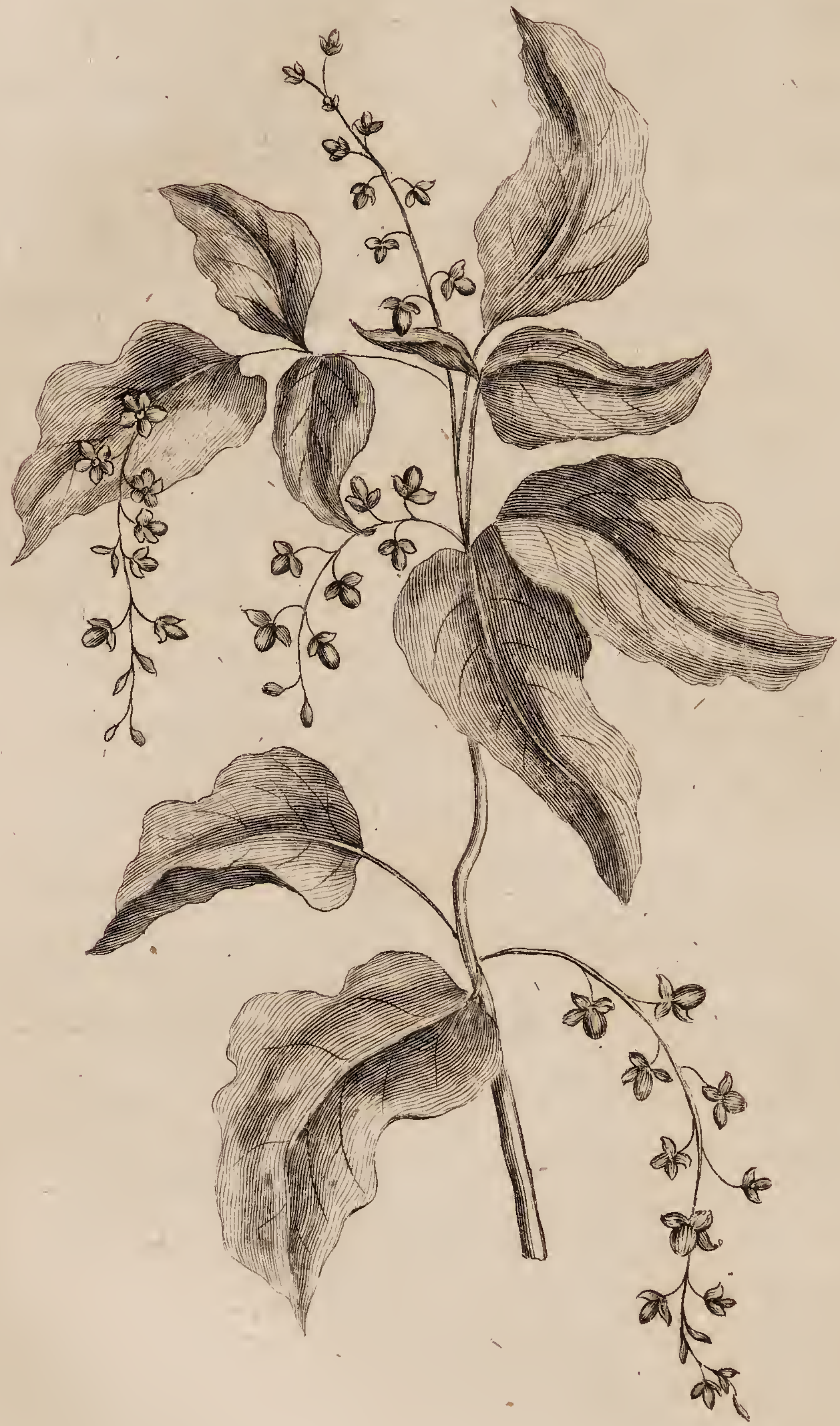
Take of the above infuſion ſeven ounces; diſſolve therein one ounce of Glauber's purging ſalt, and then add one ounce of tincture of ſenna, or of Daffy's Elixir. Mix them together. And I directed the ſame quantity of the following emulſion, to be given every half hour alternately, till the children ſhould be well purged.

Take of the oil of the caſtor nut ſix ounces, diſſolved in the yolk of an egg; add thereto, by degrees, a pint and an half of water, and ſweeten it to the patient's palate. The medicines began to take effect at twelve o'clock that night, the ſtools appearing purple, like the juice of the berries, intermixed with their black ſkins; the people ſay then (as they expreſs it) the children got immediate eaſe, became ſenſible and ſpoke. Their eyes were not quite well till Thurſday; and after they were able to walk about, they complained much of giddineſs. The purgatives were repeated on Thurſday, and both operated well, but produced no diſcoloured ſtools.

From this time they continued better and better, and are now perfectly recovered.

Having never heard of any ſpecific antidote particularly adapted to correct the virus of this poiſon; I concluded the beſt way would be, as the vomits had failed, to expel it by ſtool; and was greatly rejoiced, not only to ſee my conjecture happily ſucceed in thoſe caſes, but to find the practice confirmed by ſo great an authority as Wepfer, viz.

"It does not ſeem that the patients lying for ſome time as if dead, can be aſcribed to the coagulation, congelation, or any other corruption of the blood, but rather to a certain convulſive affection of the nerves of the heart, lungs, and diaphragm; becauſe when this ſymptom went off, and the patients had evacuated plentifully a very fœtid fæcal diſcharge, no other ill accidents happened, except that they complained of great wearineſs. That a portion of the berries of the nightſhade was mixed with the blood, cannot be denied, ſince they were a long while retained in the body; yet the principal part remained in the ſtomach and inteſtines; and thence I ſuſpect the ſymptoms aroſe, becauſe they ſoon remitted after a plentiful diſcharge by ſtool." Wepfer, page 291.



Rivina or American Nightshade.

J.Prestwich del.

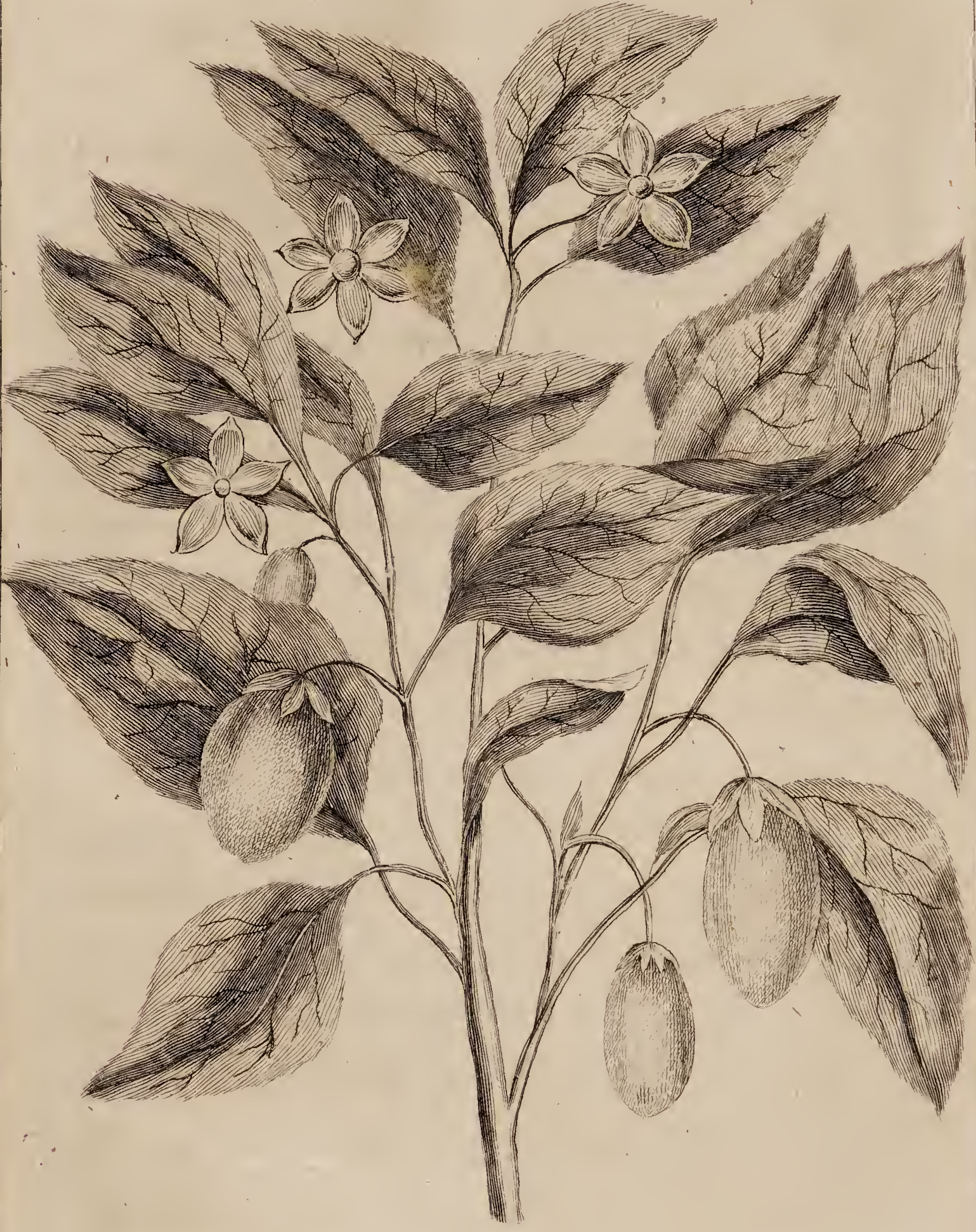
J.Royce Sculp.

RIVINA, or American NIGHTSHADE.

The root is ſpreading, and full of fibres. The ſtem is ſlender, weak, and edged; but it will run to a great length if ſupported, and will ſpread out in a pleaſing wildneſs, into a multitude of ſcattered branches. The rind is of a greyiſh brown toward the bottom, and paler in the younger ſhoots; and the branches generally ſwell out at the joints where the leaves, fruit, and flower cluſters riſe.

The leaves are large and handſome, they are ſupported on ſhort, purpliſh, hairy footſtalks. They are broad at the baſe, waved at the edges, and ſharp-pointed. Their colour is a very light green; but toward autumn they uſually grow purpliſh, and they are naturally a little downy; this is ſometimes more, ſometimes leſs, and often ſcarce perceptible. The flowers are placed in a double ſeries, on long, ſlender, common foot-ſtalks. Each flower has, on this common-ſtalk, its little pedicle; and they are ſmall and inconſiderable; their colour whitiſh. The berries follow, and are of a fine deep red, and often of a violet purple. This change of colour ariſes from the culture. The juice of theſe berries ſtains with a very glorious colour, but it is not laſting. The flower conſiſts only of a cup, and the parts of fructification. This cup ſeems part of the body of the flower; which is formed of a ſingle piece divided at the edge into four ſegments, and in colour white.

Within this cup, in which there are no petals, ſtand four ſmall filaments, diſtinctly crowned with their ſeparate buttons. In the centre of theſe appears a ſingle ſtyle, ſhort, and produced from a large and roundiſh body, the rudiment of the fruit. This, by degrees, ripens into the perfect berry, and the cup remains under it, but changes form and colour; it becomes green, and its ſegments roll back. In each berry is contained



Egg Nightshade.

J Prestwich del.

J. Royce Sculp.

contained a roundiſh rough ſeed. The plant is a native of Jamaica, Barbadoes, and the Caribbee iſlands, &c.

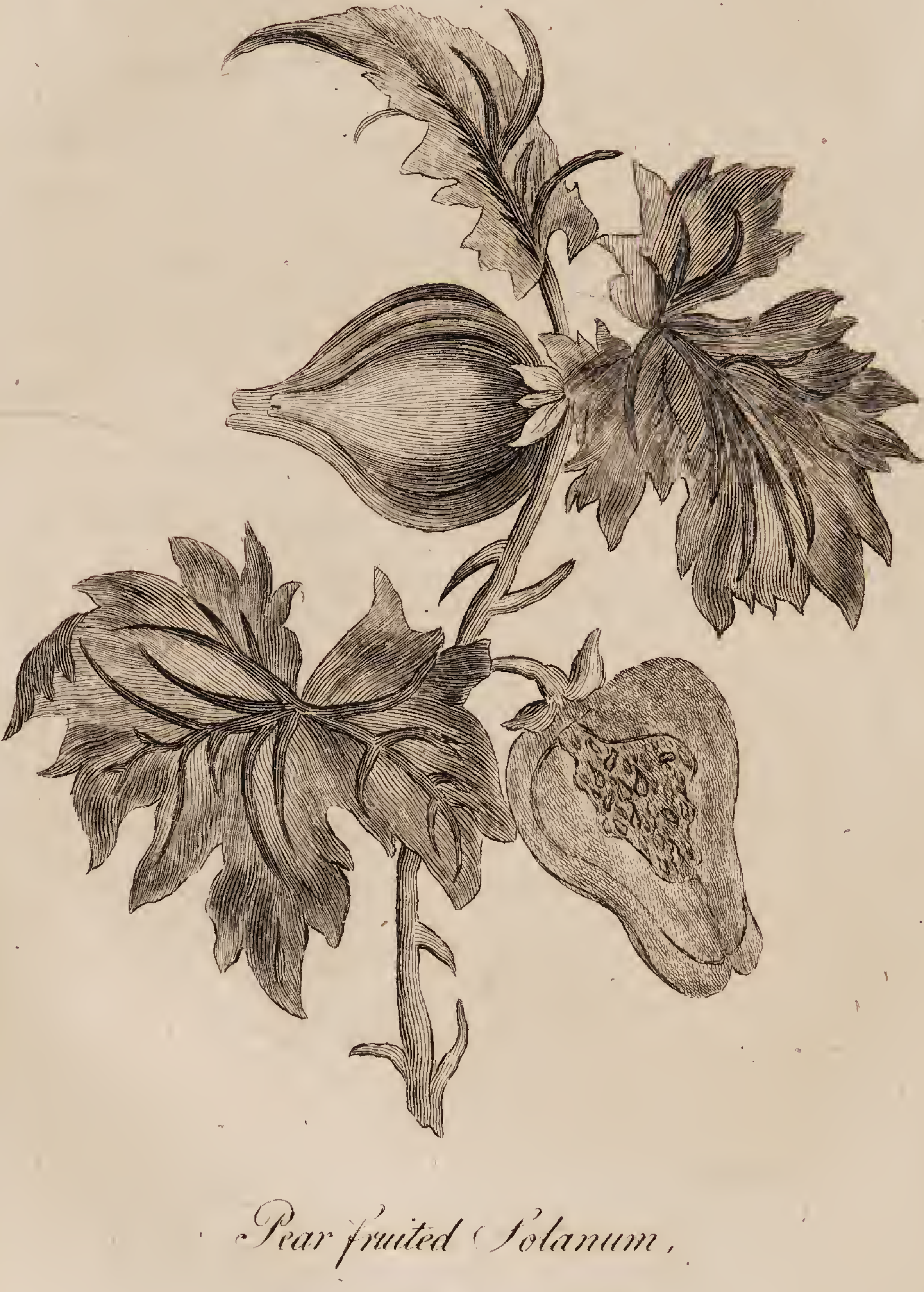
OF EGG NIGHTSHADE, CALLED THE MAD APPLE.

This plant demands a place among thoſe of curioſity, from the ſingularity of its fruit, which is of the bigneſs and colour of an egg. It has been ſuppoſed, that being of the nightſhade kind, which is thought in general poiſonous, and characteriſed by ſo ſingular a name, it had the effect of cauſing madneſs; but ſome ſay it is an error.

It is truly and properly of the nightſhade kind, and its name, according to Linnæus, is ſolanum caule inermi herbaceo, folis ovatis tomentoſis integris, calycibus ſpinoſis. Weak herbaceous nightſhade, with oval, undivided, downy leaves, and prickly cups.

The plant is two foot and an half high, of an irregular growth, and ſpreading: the ſtem is round, thick and hairy; the leaves are large, and they ſtand upon long footſtalks; they are broad at the baſe, ſmaller to the point, and irregularly waved at their edges; their colour is a pale green, and they are hairy,

The flowers are not of any great beauty; they are moderately large, and of a duſky white, with more or leſs of purple. The fruit which follows theſe is of the bigneſs of a hen's egg, white, ſoft, and juicy.



Pear fruited Solanum,

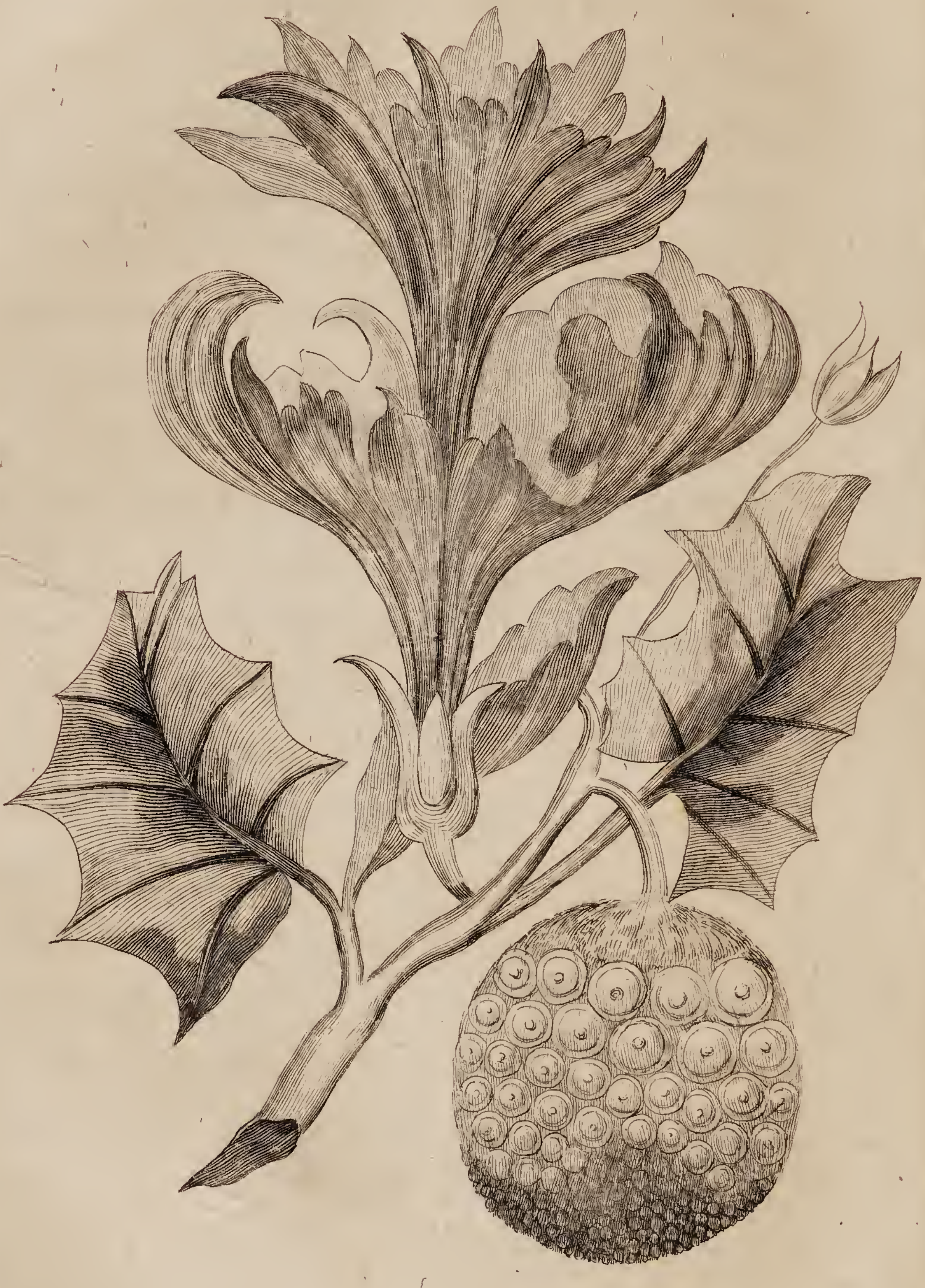
or Barbadoes Batchelor's Pear.

J. Prestwich del. J. Royce sculp.

PEAR FRUITED SOLANUM.

The pear-fruited ſolanum, its vulgar name is the Barbadoes Batchelors Pear; ſome, from its fruit having the ſhape of a breaſt with its nipple, have called it ſolanum mammoſum: Linnæus names it ſolanum caule aculeato herbaceo, foliis cordatis quinquelobis, utrinque villoſis aculeatis. Herbaceous nightſhade with prickly ſtalks, and heart-faſhioned leaves, divided into five parts, and prickly.

It is a ſpreading plant of a yard high. The ſtalk is green and round, and it is armed with many ſtrong crooked thorns, the branches ſpread themſelves irregularly, and the leaves ſtand thick upon them. They are extremely ſingular and beautiful, each has its ſeparate foot-ſtalk, and the ſhape is ſomewhat like an heart. They are broad at the baſe, where they are uſually indented for the reception of the ſtalk, and they have five principal diviſions. Their colour is a ſtrong green, but it is rendered paler by a downy matter that hangs about them; and they are armed on each ſide with numerous upright yellow thorns. The flowers are ſcattered over various parts of the plant; and they are not conſiderable: each is formed of a ſingle petal, which is tubular a little way at the bottom, and formed into five large ſegments at the edge; and the colour is naturally white, but ſometimes daſhed irregularly with a duſky purple; the fruit is the conſpicuous product; this is ſaid to be of the ſhape of a pear, but this is an indeterminate word, pears being of various forms; it reſembles, in ſhape and ſize, a common fig, but grows at the large end to the ſtalk. Its ſkin is ſmooth, and its colour is a pure bright gold yellow. The plant will often have forty of theſe upon it at a time, and in that caſe makes a very conſpicuous appearance. To know its claſs, the ſtudent



Proliferous Datura.

J. Prestwich del. J. Royce Sculp.

muſt tear open a flower. He will find its inner ſtructure perfectly correſpond with that of the egg nightſhade: this ſhews him to what claſs it belongs, namely, the Pentandria; and that it is of the firſt ſection, Monogynia; the filaments being five, and the ſtyle ſingle among them. It alſo ſhews him ſomething more, it juſtifies Linnæus upon the principles of his own method, for joining that plant with the nightſhades.

This plant is a native of the American iſlands.

PROLIFEROUS DATURA.

Beauty and ſingularity unite in the flower of this plant, and both in a very great degree. We admire the two in a hoſe cowſlip, and with reaſon, for the plant is vaſtly pretty; but with how ſuperior an attention ſhould we regard this, which, with a colour vaſtly preferable, is more than forty times its bigneſs. Let not the botanical reader ſuppoſe it a variety of the common thorn-apple: the flower of that is white, and its fruit oblong: this is indeed a variety, but of another and much more elegant ſpecies, whoſe flower is purple, and its fruit round.

Banhine and the old writers deſcribe this in the ſingle ſtate of the flower, under the name of Solanum pomo ſpinoſo rotundo, oblongo flore. Some, ſtramonium fructu rotundo; in the elegant variation of which we write here. Alpinus and Veſlingius call it Datura. This name Linnæus adopts for the genus, and adds, as its diſtinction in this ſpecies, pericarpiis ſpinoſis nutantibus globoſis: Datura, with round prickly drooping fruit. The root is long, thick, divided, reddiſh, and of an ill ſmell.

The ſtalk is robuſt and upright, but divided in a very beautiful manner into branches.

It will grow, with good culture, to five feet in height; and ſpreading its branches every way, will form a round and regular buſhy head; which, when covered with its moſt elegant flowers, diſputes the prize of beauty with moſt of the vegetable kind. The colour of the ſtalk is naturally purple at the bottom; and upwards alſo, and throughout the whole courſe of the branches, its natural pale green has a purple tinge. The leaves are numerous, ſingular, and not without their beauty: they have a robuſt footſtalk: they are oblong and ſharply ſerrated: their colour is a blackiſh green; and they have purpliſh veins. The flowers are very large and elegant; they riſe one within another, and are on the outſide of a glowing purple, mixed with crimſon; and within of a pure and perfect ſnowy whiteneſs. This riſe of one flower in another is a luxuriance of nature; but 'tis not in many caſes the mere effect of culture. This plant is wild about the cape of Good Hope, and it is a native of Africa, and the Eaſt Indies. A cup receives the bottom of this flower, of an oblong ſhape, tubular, and formed of a ſingle piece, ſwoln at the bottom, marked with five riſing angles, upwards, and at the rim divided into as many ſegments. 'Tis peculiar in this cup, that it is neither permanent, nor deciduous entirely. It falls, as if cut off horizontally near the baſe, leaving a rounded piece behind, which adheres to the fruit. The body of the flower is formed of a ſingle petal, and is of the funnel ſhape; a term uſed by the botanical writers for many flowers; but there is not one with which it agrees ſo well as this. It is narrow at the baſe where received into the cup, and from this part it ſwells out into a vaſt hollow. Several ribs run along the body of the flower. Five are moſt conſpicuous; and at the rim it is cut in five places, or, when luxuriant, into many more, but there are five principal diviſions. The ſegments grow narrow toward the point, and end in a kind of crooked tails. This is the ſimple flower; and the variety of purple and ſnow-white render it beautiful enough; but in the moſt elegant ſtate it is proliferous: another flower riſes from within the hollow of the cup; and in ſhape is perfectly the ſame with the other. Two, three, or four flowers will ſometimes riſe from one cup thus one within another. To know the claſs of the plant, its parts of fructification muſt be examined; and theſe are always moſt diſtinct in the ſimpleſt flower. Let the ſtudent chuſe ſuch a one; and tearing it open, he will find within, five pointed filaments, terminated by oblong, obtuſe, and compreſſed buttons; and among theſe a ſingle ſtyle, with a top, formed of two plates.

The five filaments ſhew the plant to be one of the *pentandria*; and its ſingle ſtyle declares it one of the *monogynia*: the fifth claſs of Linnæus, and its firſt ſection.

This Datura is a native of Africa, and the Eaſt Indies.

THE

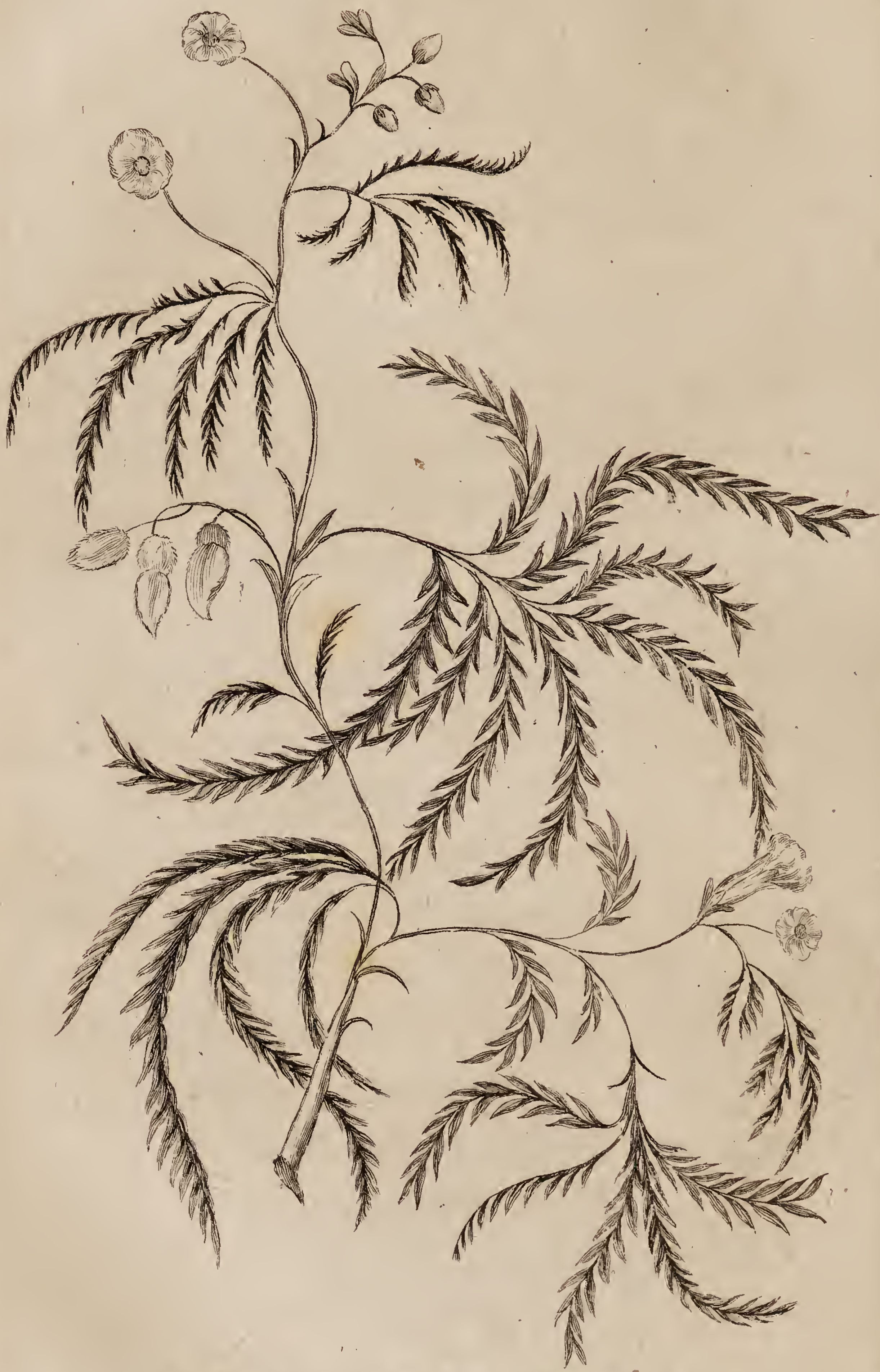
THAPSIA,

OR

DEADLY CARROT.

THE roots of this plant are long, but not very thick, with many large winged leaves, not much unlike common carrots, but having the ſegments each ſet oppoſite to one another, ſomewhat rough and hairy; the flowers are ſmall, yellow, and five-leaved, growing in umbels at the top of the ſtalks, and are ſucceeded by flat broad ſeeds, having a thin ſcaly ſkin on each ſide, of an hot taſte. It grows in Italy and Spain, and flowers in July; it works upwards and downwards, producing an inflammation of the ſtomach and inteſtines; whence a dyſentery is occaſioned. The ſame is ſo highly acrimonious, as to cauſe convulſions, and then death.

Theſe ſymptoms are removed by *taking a vomit, and drinking plentifully of vinegar, oil, and barley water.*



Thorny Sensitive Plant.

J. Prestwich del.

J. Royce Sculp.

THE

THORNY SENSITIVE PLANT.

THE general name Senſitive, is ſuited to many ſpecies of the Mimoſa, with various additions uſed to expreſs them all; and with the epithet, thorny, uſually applied to this; which poſſeſſes the quality, the term deſcribes, of ſhrinking from the touch, in greater perfection than many others. Linnæus calls it, Mimoſa foliis ſubdigitatis pinnatis, caule aculeato hiſpido, prickly rough ſtalked mimoſa, with the leaves pinnated, and diſpoſed in a fingered manner.

The Engliſh name the *Senſitive plant*, tho' appropriated to this genus in common acceptation, has been given to many others. The quality of receding from the touch being not peculiar to the mimoſa, but inherent alſo in one of the *wood ſorrels* very ſtrongly, which thence obtained early the name of the *live* plant, *herba viva*; and in a leſs degree in many others. The root is divided into many parts, and hung with fibres, The ſtem is round, as thick as a gooſe-quill, of a browniſh colour towards the baſe, and more green near the extremities; and is beſet at diſtances with ſmall brown, hooked, and ſharp prickles. The height is about two feet, and it divides into innumerable branches. The bark in the lower part uſually cracks and grows rough, but on the younger ſhoots it remains always ſmooth. The leaves are very ſingular and beautiful. Each is ſupported on a long tender foot-ſtalk, which often droops with it, and is compoſed of five, ſix, or eight parts, placed in the fingered manner; and each of theſe is regularly pinnated; the pinnæ, and their ſupporting ribs, naturally ſtand all wide expanded, but on a touch with the hand, or only on the motion of the air in an approach toward touching it, they collapſe, and, as it were, fade. After remaining ſo a little time, the ribs riſe to their proper places again; and the leaves expand with their firſt vigour.

The flowers are numerous, and they are collected into a kind of round heads, placed on ſlender foot-ſtalks at the extremities of the branches. They are of a greeniſh white at firſt, but afterwards they acquire a tinge of purple, each has its ſmall cup, formed of a ſingle piece, and divided by three irregular indentings at the rim: this forms the body of the flower, for there is no petal. The filaments are only four, very long, and very ſlender; and they are terminated by incumbent buttons. In the midſt of theſe riſes a ſingle ſtyle. The number of filaments in other ſpecies of the mimoſa is much greater, and refers the ſtudent, thus far inſtructed in the ſcience, to their origin, for finding its claſs. They riſe from the receptacle, and he is therefore to refer the plant to the polyandria; the ſingle ſtyle ſhews it one of the firſt ſection of that claſs, the monogynia. This, if the ſtrict rule of ſcience be obſerved, does not belong to the ſame claſs with them. Linnæus has, however, placed it among the others, conſidering the general agreement of parts, as a mark of its being a *mimoſa*, although it differs from them in a point ſo eſſential. It agrees indeed neither with the eſtabliſhed character of the claſs or genus in which this author has placed it. This plant is a native of the *Brazils*, and with us requires a ſtove: but with due care it will arrive to full perfection. In favourable ſummers it will live many months in the open air.

EXPERIMENTS.

This plant at noon-day has its leaves raiſed and expanded. In the night it is not capable of the common motion on the touch, for the leaves are already in the condition whereto they would be reduced by it. In the day they riſe and ſpread: and it is then that the ſtrange effect appears on touching them. Light expands the lobes, ſeparates the ribs, and raiſes the foot-ſtalks.

It does this by putting all the parts of them into a vibrating motion. That the power of motion in this plant depends upon the effect of light on the expanded ſurface of the leaves, is certain; for till they are expanded they have no ſuch power. The young leaves, even when grown to half an inch in length, have no motion on being touched, tho' roughly and ſuddenly. The analogy between the effect of a ſudden motion, and of the abſence of light, is confirmed alſo by this; for as light decays naturally in the evening, or artificially by ſhutting up the plant, the leaves firſt cloſe, and the foot-ſtalks afterwards fall. The power of abſolute darkneſs is greater in the ſenſitive plant, than that of the rudeſt touch. The rudeſt touch will only cauſe the lobes of the ſeparate leaves to cloſe, and the foot-ſtalks to hang down; the two leaves will remain far aſunder. The effect of abſolute darkneſs exceeds this; for the two leaves alſo abſolutely cloſe together, and it appears as if the foot-ſtalks ſupported only one. This proves, that the expanſion of theſe parts depends ſolely upon the effect of light; and that, although it may be diſturbed by ſuper-added and ruder motion, yet it can be taken away abſolutely only by darkneſs; by the want of that on which alone it depended. Theſe experiments every one may eaſily repeat; the obſervations will be eaſily made by any who have ſtoves; they are conſtant and invariable, and the concluſions from them are certain, for no other cauſe intervenes. The effect of light is continual while the light continues. The plant, therefore, whoſe leaves have been thrown down and cloſed by a rude ſhock, is immediately affected by the light; for at its firſt appearance in the morning, or on its admiſſion, when the leaves have been cloſed by artificial darkneſs, the vibration inſtantly begins; and if the light be at its full ſtrength, the expanſion and elevation of the lobes is ſo quick, that one may almoſt look upon the plant and ſee it. A few minutes often perfect it.

That the touch of the leaves no other way affects them than by a motion greater than their own internal vibration, is plain from this, that if they be touched with a finger in ſo deliberate and gentle a manner as not to move them, no effect is produced; and on the other hand, if they be any other way moved, the full effect follows. If the pot be ſhook, though no part of the plant be touched, the leaves cloſe, and their foot-ſtalks fall: or if the wind blows rudely on them, the effect is the ſame.

The honourable Sir Hans Sloane, in his obſervations from *Piſo*, ſays, that the *root of this ſhrub is an antidote againſt the ſhrub itſelf*, which is very poiſonous, and kills by degrees, making the unhappy ſufferers cachectical, ſhort-winded, and melancholy till they die.

THE

AMERICAN,

OR

CANADA FLAT LEMON TREE.

THE root of the flat lemon-tree, which grows in Canada, is a deadly and ſubtile poiſon, but at the ſame time a good antidote againſt the bite of ſerpents; it muſt be pounded and applied directly to the wound. Father Charlevoix, a jeſuit, ſays, this remedy cures effectually and never fails. This tree is ſo called from its fruit, the lemons have the ſhape and colour of thoſe in Portugal, but they are ſmaller, and of a flat taſte; they are excellent in conſerves.

THE

AMERICAN FLEA PLANT.

THE ſame author ſays, that the American Flea Plant is dangerous, either to touch or look at.

WOLFSBANE.

THIS Plant is called *Winter Aconite,* and *Wolfsbane.* The name our gardeners have for it, is the *Engliſh* of *Aconitum Hyemale,* by which the common writers expreſs it; 'tis properly a kind of Hellebore. This *Morriſon* knew, and named it Helleborus ranunculaides præcox: Linnæus and Van Royen confirm this determination; and add the peculiar character riſing from the place of the flower, as its diſtinction from the other ſpecies, helleborus flore folio inſidente: Hellebore, with the flower fixed upon the leaf. This plant is highly poiſonous; and Camerarius ſays, the root in a ſmall doſe is purgative; tho' in an over quantity it would do miſchief. This refers it to the Hellebores, even in quality. The root is tuberous and irregular in form; blackiſh on the outſide, fleſhy, and of an acrid taſte.

The whole plant above the ground conſiſts of a leaf raiſed in a foot-ſtalk, and crowned in the centre by a flower. Many of theſe ſtalks uſually riſe from the ſame root; but all of the like kind and compoſition, each being a ſeparate and perfect plant. The ſtalk is round, hollow, ſmooth, naked, whitiſh at the bottom, and all the way up more green.

On the ſummit of this is placed a ſingle leaf. This is not joined to the ſtalk at its edge, but fixed upon it by the middle, and is of a handſome ſhape. The general form is roundiſh; but it is very deeply divided into an irregular number of long and narrow ſegments, and theſe often ſplit again at the ends. The colour is a freſh and lively green, but with ſome light tinge of yellow.

In the centre of this leaf is placed a ſingle flower. This has no foot-ſtalk; it is large, and of a beautiful yellow, tinged toward the bottom often with a caſt of greeen. The flower is compoſed of ſix petals, broad, oblong, obtuſe, and naturally a little bending inwards. There are in the hollow of the flower ſix nectaria, ſingular and elegant in their ſtructure. Each is formed of a ſingle leaf, tubular, ſhort, narrow at the bottom, and widening to the top, where it opens inward with a gaping mouth; and the whole ſix are placed in a circular direction. The filaments which decorate the centre, are very numerous, ſlender at the top, and crowned with buttons of a particular form. They ſtand erect, not croſs-wiſe, as in the laſt mentioned flower; and they are oblong, compreſſed, and broader toward the top than at the bottom. In the centre of theſe riſe ſeveral ſtyles, of a horned figure, and terminated by thick tops.

The plant is a native of the Alps.

There is another aconite, called blue hairy aconite with a larkſpur flower. Wolfsbane, with the Siberian larkſpur flower; or Siberian larkſpur: as it is common in Siberia.

GREAT DORONICUM,

OR

LEOPARD's BANE.

THE root is white, of a ſingular form, divided into ſeveral parts, and ſpreads under the ſurface; the principal diviſions are jointed, and have a kind of ſcaly covering; from the lower parts of theſe run down into the earth a few fibres. The leaves which firſt riſe from the root are ſupported on tender foot-ſtalks, and are large, broad, obtuſe, and of a pale green; high rib'd on the under ſide, and covered with a ſlight and delicate ſilvery down.

The ſtalk is thick, but tender, marked like the fluted column of ſome order, with a number of regular ridges, hollowed between; of a pale green, covered with light hair, a foot or more in height, hollowed, and divided into a few branches. The leaves are placed ſingly, at conſiderable diſtances on this, and are ſhaped like the head of an arrow. They are broadeſt at the baſe, where they ſurround the ſtalk more than half, and ſometimes entirely; and they become gradually ſmaller at the end, where they terminate obtuſely; they are waved and indented at the edges, of a pale green, with ſilvery hairs, and they have high whitiſh ribs on the under ſurface. At the top of the ſtalk, and of the branches, ſtand three or four ſmaller leaves cloſer to one another, and from the boſom of each riſes a ſtalk, with two or three buds for flowers, which open in ſucceſſion. They are large, yellow, and of the radiated kind: they have not the aſpect of garden flowers, yet are not without beauty on a near examination. In the bud, the yellow petals are laid together, ſo as to form a little golden button; over which the ſegments of the cup, which are much longer, meet in a looſe but delicate manner, defending, without hiding, the rudiment of the flower. In a ſtate a little more advanced toward ripeneſs, the petals open, and ſhew, tho' ſtill within, the broad rudiment of the diſk, formed of pale yellow riſing dots. The flower when full opened is an inch and half in diameter, formed of a roundiſh riſing diſk, crowded with innumerable floſcules, and of a circular ſeries of rays; the whole incloſed at firſt, and afterwards defended by a delicate pale green cup. The flower is yellow throughout, but the diſk has ſomething of an orange tint; and the rays are perfect gold. The ſtalk ſwells into a turbinated lump for the ſupport of the flower, and from the head of this riſe thirty elegant green leaves, forming a cup, which widens all the way upwards, and is of more than half the length of the rays of the flower when expanded. Theſe leaves are placed in two ſeries, an outer and an inner; and they are narrow, ſwelled at the baſe, broadeſt at a little diſtance above that part, and terminate in a point like a hair; the leaves of the cup are thirty in number. There are two kinds of floſcules which compoſe the flower of the Leopard's bane.

This Doronicum is a native of Europe.

LACINIATED RUDBECKIA,

OR THE

CANADA SUN-FLOWERED ACONITE.

THE root is thick, and beſet with many long and large fibres. The ſtalk is firm, upright, and five feet high; round, but deeply ribbed, and of a ſtrong green. The leaves ſtand irregularly, at ſmall diſtances, and they are large. Their colour is a deep green, and they are divided into three principal parts, and thoſe again are deeply cut and jagged. As the whole leaf is large, ſo are all its parts; and when theſe ſegments are notched, as they often are in the larger leaves, theſe indentings are vaſt, open, and diſtant. The whole plant has a ſlight hairyneſs. The flowers are numerous, large, and elegant; they terminate the main ſtalk, and the many branches from the boſom of the leaves; they are of the compoſite radiated kind, large, and very beautiful. They are, when full open, about three inches and a half in diameter; and are compoſed of numerous, long, yellow rays, and a multitude of floſcules arranged in a kind of cone, and opening in regular ſucceſſion from the bottom. The cup is compoſed of ſeveral leaves in a double, triple, or quadruple ſeries; they are oblong, broad, and of a fine green. Beſides the general cup, each of the floſcules has a kind of ſmall cup, or regular ſupporting rim from the receptacle.

Immediately within the general cup are placed the rays; theſe are female floſcules, and within them riſes the cone of the tubular floſcules, which have both male and female organs and are thence called hermaphrodite; the rays are uſually fourteen in number, ſometimes more, rarely leſs. They are very long, moderately broad; they are nipped at the end, and naturally hang down. Their colour is a very ſtrong and fine yellow, and they are uneven on the ſurface, ribbed, and furrowed. The floſcules at firſt appear in the form of ſo many cloſe green buttons, ranged in a regular manner. The firſt that open are a ring or ſeries juſt above the rays, and after this they burſt out in ſucceſſion. When fully open they are hollow, ſomewhat funnel-ſhaped, ribbed on the outſide, and divided into five parts at the rim. From the hollow of theſe floſcules, burſt five filaments with cylindric buttons; and after theſe have ſhewn themſelves ſome time, a ſimple ſtyle appears from the rudiment of the ſeed, whoſe head ſplits into two parts, and theſe turn back.

When the flowers are fallen, a head of naked ſeeds preſents itſelf in view; this is of a conic form, and is ſupported by the common cup. The figure of each ſeed is an oblong ſquare.

Yellow Pyrenean Aconite.

Many authors have confounded this with the common yellow *aconite*. Ray makes a juſt diſtinction, and calls it *Aconitum Pyrenaicum luteum foliorum ſegmentis ſibi invicem incumbentibus.* The root has a multitude of long twiſted, blackiſh fibres, connected to a ſmall thick head: the ſtalk is a yard high, pale, upright, and not branched: ſeveral ſhoots riſe from the boſoms of the upper leaves, but they are ſmall and erect; the main ſtalk runs up ſingle and undivided; the leaves are of a pale, but not unpleaſing green; they have long footſtalks of a faint green, and hang from them in a palmated form, but with a wild and ſtrange irregularity. Each leaf is divided to the rib into five ſegments; theſe are long, narrow, rarely of equal breadth, and cut into deep ſegments, or at leaſt deeply notched at the edges, and ſharp pointed. The lower leaves ſometimes have theſe ſegments expanded flat and regularly; but the general diſpoſition is much otherwiſe. The flowers are extremely elegant; they are numerous, and terminate the main ſtalk, and all the branches, in a kind of ſhort ſpikes. Each has its footſtalk, and their colour is a very ſingular pale, and as it were whitiſh yellow; their form is properly that of the *aconite* flower. There is no cup; the body of the flower is compoſed of five petals, one of which is placed above, two below, and two ſideways. The upper petal is tubulated and galeated, inverted or placed with the back upwards, and is obtuſe, the head bent back to the baſe, and pointed: the baſe, where it is connected, ſtands oppoſite to this head. There are two nutaria very ſingularly diſpoſed; hid as it were under the upper petal: they are hollow, have an oblique mouth, ſtand nodding; and have a crooked tail; theſe ſingular parts are placed on long foot-ſtalks, ſlender toward the top. The filaments are numerous, ſhort, and ſlender;

they are broad at the baſe, and have ſmall upright buttons. In the midſt of theſe ſtand five ſtyles, riſing from as many ſeed veſſels, terminated by ſimple reflected heads. The fruit is compoſed of the ſame number of ſeed veſſels, and each contains ſeveral rough angulated ſeeds. This, and the common yellow *aconite* have five ſtyles, and as many rudiments of fruit; but they are perfect *aconites*, as they agree in all the other characters with the reſt of that genus.

This plant is common in the north of Europe.

PROLIFEROUS MOUNTAIN CROWFOOT,

OR THE

PORTUGAL CROWFOOT.

MOST writers in botany have named it, by its proper title *Ranunculus.* Linnæus calls it Crowfoot with ſerrated leaves, and ſingle flowers on naked ſtalks. The root is formed of ſeveral oblong tuberous pieces. The leaves ſpread in a pretty cluſter on the ground, and have ſhort footſtalks, which are white, with a light tinge of green; the leaves are of a pale agreeable green, and have a few ſtraggling whitiſh veins. Theſe are very conſpicuous on the under ſide, and the leaves often riſe into a kind of ſoft lumps or tubercles between them. The ſhape of the leaf is oval; it is a little hollowed in the broad part of the ſtalk, and grows narrower to a point. The edges are beautifully ſerrated. Among theſe riſe the ſtalks. They are numerous, ſlender, of a whitiſh green, but tinged a little with red towards the baſe, and about fourteen inches high. No leaves grow on theſe; each is deſtined for the ſupport of one flower, and this, in the ſtate of nature, is large, yellow, formed of five petals, with a great cluſter of filaments in the centre, and of a light fragrance. Naturally the petals, when the root is well nouriſhed, will exceed the proper number, as in our meadow crow-foot, being ſometimes ſeven or more; but luxuriant art makes them innumerable, and adds the pleaſing wonder of a ſecond production. On the top of each ſtalk, as it riſes from the root, appears a green, oval button, tipped with gold: this, as the ſmall ſtalk riſes in height, ſwells, and expands, till by degrees it is, in the full luſtre of a double flower, compoſed of multitudes of narrow and ſharp pointed petals in various circular ſeries; and all of a delicate yellow. In the midſt are buried ſome fine threads, with their buttons, which impregnate the rudiments of many ſeeds, appearing afterwards in an oblong cluſter. Sometimes there riſes a ſmall ſtalk, ſupporting on its top a repreſentation of the firſt in miniature. The little flower is formed exactly as the larger one, but the colour is fainter; the bottom where it joins the ſtalk is white; the firſt ſeries of petals are alſo white, tipped with green, and tinged with a little yellow; and the reſt are of a fainter yellow than thoſe in the original or lower flower.

GOLDEN PROLIFEROUS CROWFOOT.

This, as the proliferous Datura, and the Portugal Crow-foot, has a ſtalk riſing from the centre of the double flower, bearing another. The original plant from which this is raiſed by culture is of *Aſiatick* origin. Linnæus calls this ſpecies by the name, ternate and alternate leaved crow-foot, with the diviſions all the way in threes, the ſegments divided at the edges, and with the ſtalk branched in the lower part. The root is tuberous and irregular, formed of ſeveral oblong pieces, with a few thick fibres. The firſt leaves are numerous, they ſpread variouſly from one head, ſome erect, and others on the ground; they are differently divided according to their growth and ſize, but always into threes; the ſegments are oblong, and notched at the edges. The ſtalk is a foot high, round, of a pale green, ſomewhat hairy, and tolerably firm. There are two or three leaves upon it, divided in the ſame manner as thoſe from the root, and ſlightly hairy: their colour is a pale green, and their ſubſtance tolerably firm. The top ſupports a very large and elegant flower of the bigneſs of a common roſe, of a bright gold yellow, and compoſed of innumerable petals; from the centre of which riſes a ſlender green ſtalk, an inch and a half in length, ſupporting on its ſummit a ſmaller flower, perfectly reſembling the larger. The natural colour is the plain bright yellow already mentioned; but the ſame luxuriant culture, which ſwells the flower to this bigneſs, enlarges the number of the petals, and ſends up this additional offspring. Its character may be traced in the original and ſimple flower: in that the botaniſt will find them, as in the common crowfoot of our meadows.

The petals in that are five; they are broad, obtuſe, and connected to the receptacle by narrow bottoms; and at a little diſtance, above this bottom, there is in each a ſmall hollow; this is the nutarium of the flower. In the centre ſtand numerous filaments, crowned with oblong buttons which appear double; and in the midſt of this tuft are numerous very ſmall and reflected ſtigmata; theſe have no ſtyles, but adhere to as many rudiments of ſeeds.

ORIENTAL MEADOW CROWFOOT.

This grows in the remoteſt part of the Eaſt, and appears much like our meadow crowfoot, only this has nine petals, and ours but five: Linnæus calls it Meadow Crowfoot with multiplied leaves, with prickly bent ſeeds, ſmall toward the point, and with the cups turned back.

The root is compoſed of numerous long fibres, connected to a ſmall head. The firſt leaves have long hollowed footſtalks, and are large, and divided into a multitude of long narrow ſegments: they are of a tough ſubſtance, and their colour is a greyiſh green: they are covered with a looſe cottony white matter, the ſtalk is a foot high, upright, round, and divided into a few branches: the leaves ſtand alternately on this, and reſemble thoſe from the root, by their diviſion into numerous, long, and narrow parts: their colour is the ſame whitiſh green with that of the others, and they are covered with the like cottony matter. The flowers terminate the ſtalks and branches, and ſeveral are ſupported alſo on ſlender footſtalks, riſing from the boſoms of the upper leaves: they are in the whole numerous; and are conſpicuous both in ſize and colour. They are half an inch in diameter, and of a very fine, though not ſtrong, yellow colour.

The cup is compoſed of five oval leaves, and theſe, when the flower is open, turn back, and, hanging downward, ſhew the hollow of their inſide, tinged with the yellow of the flower, though paler.

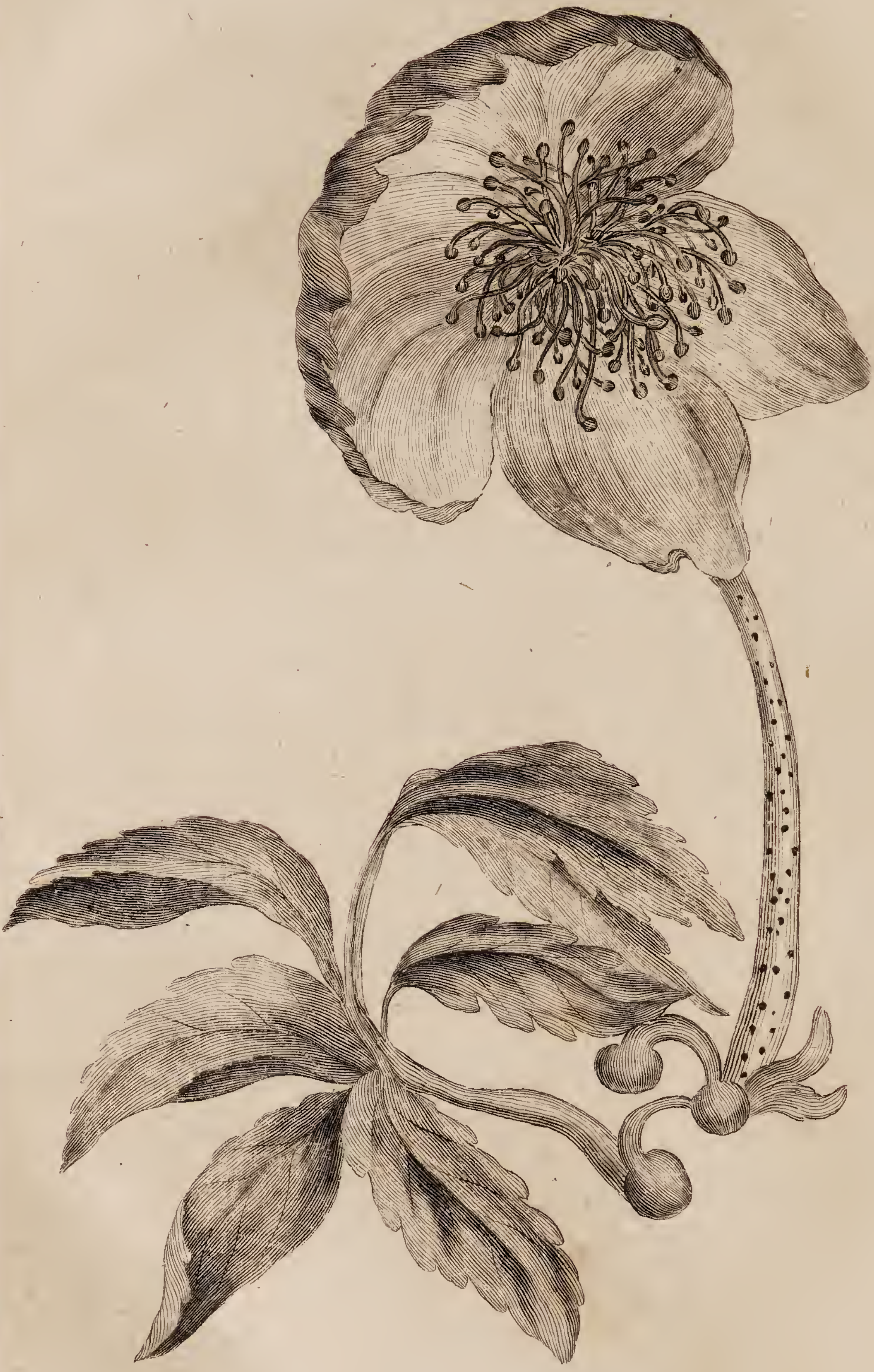
Five petals form the body of the flower, and theſe are obtuſe at the end, broad, and fixed to the receptacle by ſmall baſes. A little above this part, in each petal, there is a ſmall hollow, the nutarium. The centre of the flower is filled with a multitude of filaments, and a cluſter of rudiments of ſeeds, with their heads, placed in the midſt. The filaments are ſhort, and are crowned with doubled buttons. Each rudiment has its ſeparate head fixed to the ſummit without any ſtyle; and when the flower is fallen with its cup, theſe ripen into ſo many oblong pointed ſeeds.

Double white Crowfoot, White Alpine, or Great white Mountain Crowfoot.

This by art has been brought to a double flower, the ſame as the other crowfoots. This plant is common in the wilds of *Bohemia*. It is now common in our gardens. Linnæus calls this ſpecies, crowfoot, with all the leaves divided into five parts, and thoſe lanceolate and deeply cut and notched. In this he refers to the plant in the ſingle ſtate of the flower, naming the double form, as a variety. Others in its ſingle ſtate have called it the *white alpine crowfoot, and great white mountain crowfoot.*

The root is compoſed of numerous thick ſpreading fibres, which riſe as it were immediately from the baſe of the ſtalk, without any head. The firſt leaves are ſupported on long foot-ſtalks, and are of a fine deep green. They are divided to the baſe into five parts; and theſe are oblong, broadeſt toward the middle, and ſharp pointed; and they are deeply jagged, and notched at the edges; the ſtalk is round, thick, and branched, two feet and a half high, of a pale whitiſh green, and often ſtained with brown. The leaves on this are like thoſe from the root, only ſmaller, and ſtand irregularly, and at diſtances. The flowers terminate the branches, and are very numerous and elegant; they are of a ſnowy whiteneſs, and are compoſed of numerous ſeries of ſmall, curled, and waved petals. This is the ſtate of this flower, when cultivated by the gardener.

The ſingle flower is in all reſpects, except colour, like thoſe of the common crowfoot of our meadows. It has its little cup of five leaves; the petals are five, and each has its hollow at the baſe, the nutarium of the flower: the filaments are extremely numerous, riſe from the receptacle, and ſurround a great cluſter of rudiments of ſeeds; each of which, though deſtitute of a ſtyle, is crowned with its proper head. Theſe, as we have before obſerved, are the characters of all the crowfoots, which refer that genus to the *polyandrous* claſs, and under that head to the laſt diviſion, the polygynia.



Black Hellebore.

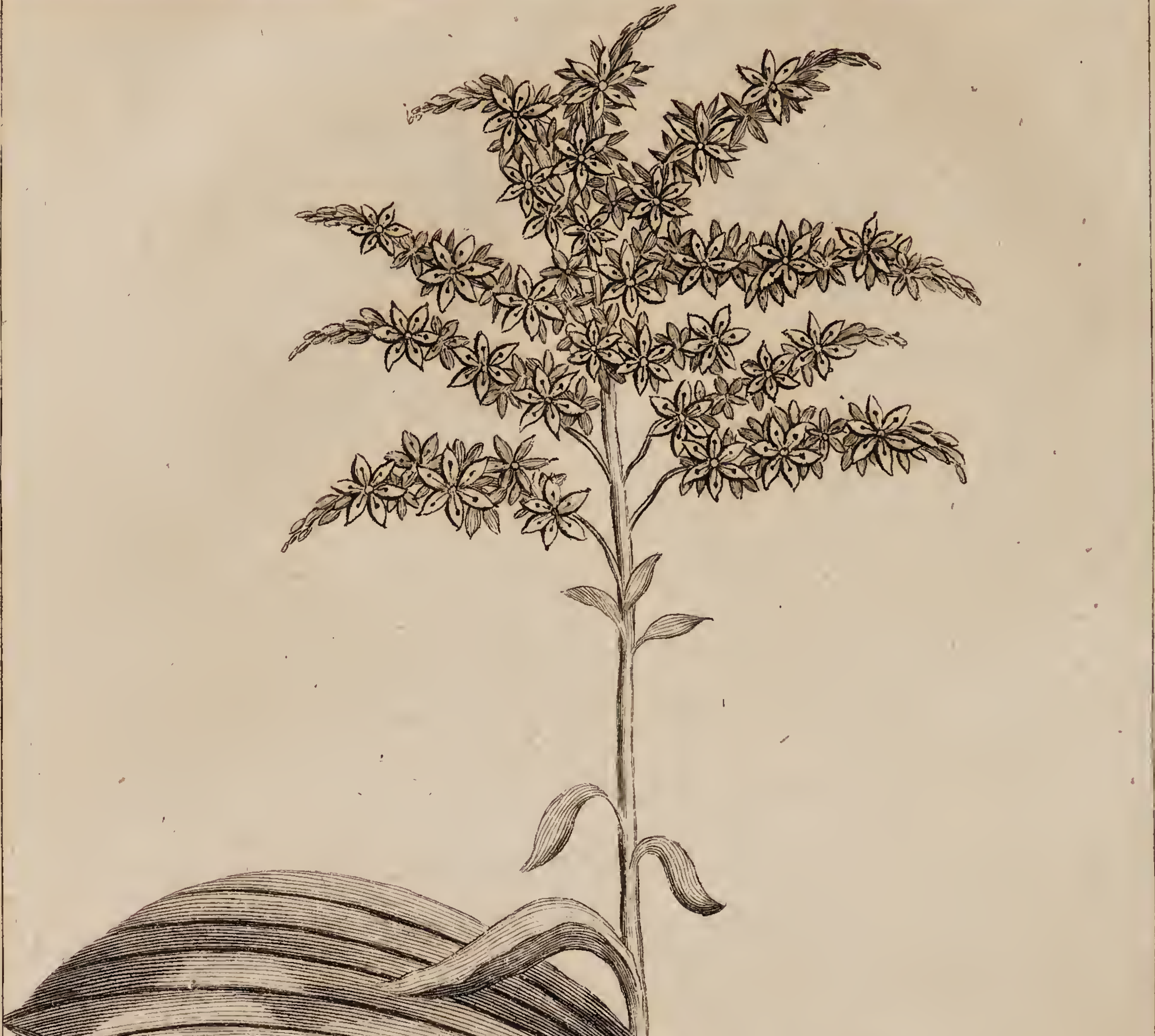
J. Prestwich. del.

J. Royce Sculp.

BLACK HELLEBORE.

TRUE Hellebore, Roſe Hellebore, &c. *Linnæus* calls it Hellebore, with the flower-ſtalk almoſt naked, and with the main foot-ſtalk of the leaf divided into two parts. The root is compoſed of innumerable, thick, black fibres, long, tough, and variouſly entangled, riſing from a ſmall head, and ſpreading every way to a vaſt diſtance. The leaves are large and numerous, and are divided in that coarſe fingered method, called in botany *pedated.* The foot-ſtalk of this divided leaf is thick, ſhort, and juicy; it uſually riſes ſlanting, and is of a freſh green; when the plant is in perfection, it is ſtained with red, in various and irregular little ſpots. The leaves placed on its divided top, and forming what is called the entire pedated leaf, are uſually nine; they are oblong, broad, of a ſtrong green colour, and of a very firm ſubſtance, indented round the edges on their extreme part, but perfectly entire below; and often cut out into a ſmall point at the end.

The diviſions of the footſtalks at the end are always coloured, reddiſh or browniſh; and in the beſt condition of the plant, theſe and the main rib on the back of the leaf are purple. The flowers appear among the leaves, each on its ſeparate ſtalk, and theſe ſcarce longer than thoſe of the leaves: but the ſize of the flower renders it very conſpicuous: the ſtalk is fleſhy, round, of a pale green, and elegantly ſpotted with crimſon; it is rarely quite upright. There grows no proper leaf upon this ſtalk, but cloſe under the flower there is a filmy ſubſtance, and ſometimes below this another. They ſerve, in ſome degree, as a kind of defence to the young flower. Nature has denied it a cup, but theſe films ſeem to have been given in its place. The flower itſelf is of the bigneſs of a ſingle roſe, expanded, white, or variouſly ſtained with



Dark flower'd White Hellebore.

J. Prestwich del. J. Royce Sculp.

crimſon. Sometimes the white is perfect, ſometimes the red is ſhewn throughout; but in the moſt elegant ſtate the two colours are mixed, and as in the apple-bloom, the red is principally on the outſide of the flower. In the centre are numerous filaments, ſupporting yellow buttons, and from the baſe riſe up a kind of horns, which ſhew their curled tops above the cluſter, and are of a pale green. Round about the filaments are numerous open cups, as it were, of a delicate ſtrong green, tipped with gold. There are eight ſtyles or horned tops in this flower.

DARK FLOWERED WHITE HELLEBORE.

C. Bauhine, calls it white Hellebore with a blackiſh red flower. The root is compoſed of numerous, thick, long fibres, connected to a ſmall head. The ſtalk is round, upright, firm, and near a yard high, naturally of a pale green, but often ſtained with a deep purple toward the ground. The leaves are placed alternately, and have no foot-ſtalks, but in ſome meaſure ſurround the ſtem at their baſes: they are very large, long, of conſiderable breadth, and marked with ſtrong and high ribs, all running lengthways; the ſurface of the leaf is rendered very uneven by theſe, and the aſpect is ſingular, The colour is of a pale green, often inclining toward yellowiſh and the ſubſtance firm and harſh.

The flowers crown the ſtalk in a vaſt cluſter, reaching a third part of its length; they are arranged on long common foot-ſtalks with ſhort hairy ones for every flower; and their colour is an extremely deep purple, tending to black: ſingly they are not large, but the vaſt number of them renders the plant conſpicuous, many hundreds being often open at a time. Each flower is compoſed of ſix petals, and is placed naked upon the foot-ſtalk without a cup. Ray conſidered theſe as leaves of a cup, not petals of a flower; and in the common white Hellebore, whoſe flower is greeniſh, there is much of that appearance.

The petals are oblong, lanceolate, and permanent. In the centre ſtand ſix filaments; they are ſhort and crowned with ſquare buttons. Thus far they are all alike; but, upon a nearer examination, there will be found in ſome, beſide theſe filaments, three oblong rudiments of fruit, crowned with very ſhort ſtyles, with open heads; in others only a faint repreſentation of a rudiment without ſtyles or heads. In the firſt kind, the three rudiments ripen into three capſules of an oblong compreſſed form, each containing ſeveral flatted membraneous ſeeds; in the others the rudiment fades, and comes to nothing. From this diſtinction of the flowers the claſs of the plant is known; thoſe with compleat rudiments, ſucceeded by ſeed-veſſels, are hermaphrodite flowers; the others, with the ſlight and inconſiderable appearances, which fade without fruit, are male flowers; and as theſe two kinds grow on the ſame plant, the claſs is that of the polygamia monogynia.

OF

OPIUM.

OPIUM is a concrete gummy-reſinous juice; ſomewhat ſoft and tenacious, eſpecially when much handled or warmed; of a dark reddiſh brown colour in the maſs, and when reduced into powder yellow. It is brought from Egypt, Perſia, and ſome other parts of Aſia, in flat cakes of irregular maſſes, from four to about ſixteen ounces in weight, covered with leaves, to prevent their ſticking together. It is extracted from the heads of white poppies, which in thoſe countries are cultivated in the fields for this uſe. Kempfer reports, that the heads, when almoſt ripe, are wounded with a five edged inſtrument, by which as many parallel inciſions are made at once from top to bottom, that the juice which exſudes is next day ſcraped off, and the other ſides of the heads wounded in like manner; and that the juice is afterwards worked with a little water till it acquires the conſiſtance, tenacity, and brightneſs of the fineſt pitch.

Opium has a faint diſagreeable ſmell, and a bitteriſh ſomewhat hot biting taſte: watery tinctures of it ſtrike a black colour, with chalybeate ſolutions, and thus ſeem to diſcover ſome aſtringency. Mixed with the ſerum of the blood, they thicken, and render it whitiſh; and on blood itſelf newly drawn, they have nearly a like effect. Mr. *Eller* obſerves, that on examining, with a microſcope, blood thickened by a vinous tincture of opium; the nature of its globules ſeemed to be deſtroyed; but neither from theſe, nor any of the other known ſenſible properties of this drug, can its ſurpriſing operation on the human body be reduced. Taken in proper doſes, it commonly procures ſleep, and a temporary reſpite from pain, or the action of any ſtimulating power. The cauſe of the pain it in many caſes confirms or augments; and in not a few it fails even of giving palliative relief. The caſes in which this drug is proper or improper will be beſt underſtood from a view of its general effects; which, ſo far as experience has hitherto diſcovered them, are as follows.

Of the general EFFECTS of OPIUM.

It renders the ſolids, while the operation of the opium continues, leſs ſenſible of every kind of irritation, whether proceeding from an internal cauſe, or from acrimonious medicines, as *cantharides*, and the moſt active *mercurials*, of which it is the beſt corrector. It relaxes the nerves; abating or removing cramps or ſpaſms, even thoſe of the moſt violent kind, and increaſing paralytic diſorders, and all debilities of the nervous ſyſtem. It incraſſates the ſerous humours in the fauces and adjacent parts, by which means it proves frequently a ſpeedy cure for ſimple catarrhs and tickling coughs; but in phthiſical and peripneumonic caſes, dangerouſly obſtructs expectoration, unleſs this effect be provided againſt by ſuitable additions, as gum ammoniacum and ſquills. It produces a fullneſs and diſtention of the whole habit, and thus exaſperates inflammations both internal and external, and alſo plethoric ſymptoms. It promotes perſpiration and ſweat, but reſtrains all other evacuations, unleſs when they proceed from relaxation and inſenſibility of the parts, as the colliquative diarrhæa in the advanced ſtate of hectic fevers. It promotes labour pains, and delivery, more effectually than the medicines of the ſtimulating kind uſually recommended for that purpoſe; partly perhaps by increaſing plenitude, and partly by relaxing the ſolids, or taking off ſpaſmodic ſtrictures. And indeed all the preceding effects are, perhaps, conſequences of one general power; being nearly allied to thoſe which natural ſleep produces. The operation of opium is generally accompanied with a ſlow, but ſtrong and full pulſe, and a ſlight redneſs, heat, and itching of the ſkin: it is followed by a weak, languid pulſe, lowneſs of ſpirits, ſome difficulty of breathing, or a ſenſe of lightneſs about the breaſt, a ſlight giddineſs of the head, dryneſs of the mouth and fauces, and ſome degree of nauſea. When given on a full ſtomach, it commonly occaſions a nauſea from the beginning, which continues till the opium is ejected along with the contents of the ſtomach. Where the evacuation of acrid humours, accumulated in the firſt paſſages, is ſuppreſſed by it, great ſickneſs and uneaſineſs are generally complained of, till the ſalutary diſcharge either takes place again ſpontaneouſly, or is promoted by art. An over-doſe occaſions either immoderate mirth, or ſtupidity, a redneſs of the face, ſwelling of the lips, relaxation of the joints, vertigo, deep ſleep, with turbulent dreams and ſtartings, convulſions, and cold ſweats.

ANTIDOTES.

Geoffroy obſerves, that thoſe who recover, are generally relieved *by a diarrhœa,* or by a *peculiar ſweat,* which is accompanied with a violent itching. The *proper remedies, beſides emetics, cathartics, bliſters, lixivial ſalts, and bleeding, are acids and neutral mixtures:* Dr. Mead, ſays he, has given, with extraordinary ſucceſs, repeated doſes of a mixture of *ſalt* of *wormwood,* with lemon-juice: theſe methods contract the relaxed fibres, and by their diuretic power cauſe a depletion of the veſſels.

Of the Chemical Analyſis of OPIUM.

Six ounces of opium afforded a volatile alcaline ſpirit, not very unlike to that drawn from hartſhorn, two ounces; of fetid oil, five drachms, one ſcruple, ſixteen grains; of coal, and of ſalt, two ounces, two drachms, one ſcruple, four grains.

Cause of the Virtues of Opium.

The virtues of opium are owing to a volatile *alcaline* ſalt, intimately mixed and combined with an oily, ſulphureous ſubſtance: the effects of which we muſt conſider, firſt of all upon the ſtomach, and afterwards, when they have paſſed the *primæ viæ*, upon the arterial fluid itſelf.

Of the Action of Opium.

The action of opium is very analogous to that of other volatile ſpirits, only a ſmall portion of it has a force equal to that of a greater quantity of moſt of them. A long continued uſe of opium is productive of great relaxation and debility, ſluggiſhneſs, heavineſs, loſs of appetite, dropſies, tumors, acrimony of the humours, frequent ſtimulus to urine, and *propenſity to venery*. On leaving it off, after an habitual uſe thereof, an extreme lowneſs of the ſpirits, languor, and anxiety ſucceed, which are relieved by having again recourſe to opium, and in ſome meaſure by ſpirituous or vinous liquors.

With regard to the doſe, one grain is generally a ſufficient, and ſometimes too large a one: Maniacal perſons, and thoſe who labour under violent ſpaſms, require oftentimes two, three, or more grains; though, even in theſe caſes, it is generally more adviſeable to repeat the doſe at proper intervals, than to enlarge it. By frequent uſe much greater quantities may be borne; the Turks, who habituate themſelves to opium as a ſuccedaneum to ſpirituous liquors, are ſaid to take commonly a drachm at a time; and Gracius ſays, that he knew one who every day took ten drachms. Geoffroy relates, from his own obſervation, that while the watery and vinous tinctures occaſioned quiet ſleep, the ſpirituous tincture brought on a temporary phrenzy. It is ſaid likewiſe, that alcaline ſalts diminiſh the ſoporific virtue of the opium, that fixed alkalies render it diuretic, whilſt volatile alkalies determine its action to the cutaneous pores; and that acids almoſt entirely deſtroy its force. Wherefore vinegar, drank in large quantities, is a good remedy to recover thoſe poiſoned by this drug. If opium be ſwallowed, it occaſions apoplectic ſymptoms: in which caſe bleed freely, and give as an emetic immediately, to children, from three grains to eight, of ſalt of vitriol, and from a ſcruple to a drachm, to adults, in every draught of warm water. Apply bliſters, and give large doſes of the *ſal diureticus*, or any other alcaline ſalt. Gentle *aloetic* purges ſuch as the following, are alſo very proper in this caſe.

Take of Rufus's pill and diuretic ſalt, of each one ſcruple; elixir of aloes a ſufficient quantity to mix the whole into four pills, which are to be ſwallowed immediately,

ately, and to be repeated as occaſion may require.

Or,

Take tincture of hiera picra, one ounce and an half; tincture of jalap, one drachm; mix for a doſe.

Or,

Take of the infuſion of ſenna, prepared as directed in page 120, one ounce and an half; tincture of ſenna, half an ounce; ſcammony electuary, one drachm; mix for one doſe.

EXPERIMENTS made by Dr. MEAD to aſcertain the EFFECTS of OPIUM on DOGS.

Having forced into the ſtomach of a ſmall dog about half a drachm of crude opium, diſſolved in boiling water; he quickly vomited it up, with a great quantity of frothy ſpittle; but repeating the trial, by holding up his head, and beating him, I made him retain three or four doſes, intermitting between each about a quarter of an hour. When he had thus taken near two drachms, I watched him about an hour: then he began to ſleep, but preſently ſtarted up with convulſions, fell into univerſal tremblings, his head conſtantly twitched and ſhook, he breathed ſhort and with labour, loſt entirely the uſe firſt of his hinder legs, and then of the fore ones, which were ſtiff and rigid like ſticks. As he lay ſnorting, to haſten his end, I was giving him more of the ſolution; but on a ſudden his limbs grew limber, and he died.

Opening his ſtomach, I found it wonderfully diſtended, though empty of every thing but ſome water and *opium*; a quantity of frothy mucus ſwimming in it; the inſide was as clean as if ſcraped and waſhed from all the ſlime of the glands, with ſome redneſs here and there, as in a beginning inflammation. The *pylorus* was contracted. The blood-veſſels of the brain were very full; and I took out a large grume of concrete blood from the upper part of it, cutting into the *ſinus longitudinalis*, as is not uncommon in apoplectic carcaſes; but found no extravaſated *ſerum* in the *ventricles*, nor among any of the membranes.

Generous *wine*, which the ancients gave for an antidote, can be no otherways uſeful, than as it diſſolves the *reſinous* clammy part of the *opium* ſticking to the coats of the ſtomach, and ſo forwards its expulſion by other helps, which cauſe a contraction of the muſcular fibres.

THE

LAURO-CERASUS,

OR

COMMON LAUREL.

THE poiſonous effects of this plant have been long known, by the ſudden death of thoſe who have even drank a ſmall quantity of the *ſimple water* diſtilled from the leaves, which, for the agreeableneſs of its taſte, is frequently mixed with brandy. Experiments with it have been made upon dogs, which have fully confirmed its fatal effects. Dr. Nicholls gives the following account of the appearances in the animals put to death in this uncommon way. All the dogs fell immediately into totterings and convulſions of the limbs, which were preſently followed by a total *paralyſis*, ſo that no motion could be excited even by pricking or cutting them. No inflammation, upon diſſection, was ſeen in any of the internal membranes. The moſt remarkable thing was, a great fullneſs and diſtenſion of the veins, in which the blood was ſo fluid, that even the lymph in its veſſels was generally found tinged with red.

The ſame water, injected, as a clyſter, into the inteſtines, had always the like effects, in a very few minutes. A quantity of this water was prepared much ſtronger than ordinary, by diſtilling it twice from freſh leaves. By this proceeding he had about a drachm of a heavy oil, of the colour of olive oil, ſubſiding at the bottom of about three pints of water: this, by frequent ſhaking, was quite incorporated again with the water.

About two ounces of this killed a middle-ſized dog in leſs than half a minute, even while it was paſſing down the throat.

There cannot be a more convincing proof, than the effects of this ſimple water, that all poiſons act principally upon the nervous fluid. How ſurprizing are its effects! That a ſimple liquor, without any extraordinary ſenſible qualities, ſhould even in its paſſage into the ſtomach, nay, when thrown into the lower guts as a clyſter, inſtantaneouſly kill, and that without any marks of inflammation or corroſion, can no other way be accounted for, but by an immediate effect upon the animal ſpirits.

Animals, killed in this way, after ſtrong convulſions, die univerſally paralytic; and a ſudden ſtop being put to the circulation, the blood in the veins remains perfectly fluid.

It ſeems that the deadly power of this water is entirely owing to its being over-ſaturated with that *heavy oil*, which this tree contains.

THE ANTIDOTE, AS PROVED BY AN EXPERIMENT.

To two ſmall dogs, an ounce of ſtrong *laurel water* was given. They fell immediately into moſt violent convulſions, which were ſoon followed by a total loſs of their limbs. When they ſeemed to be expiring, we applied to their noſtrils a phial of good ſpirit of *ſal armoniac*, and forced a ſmall quantity of the ſame down the throat; they inſtantly felt its virtue, and, by continuing the uſe of it for ſome time, by degrees recover'd the motion of their legs; and in about two hours, walked about with tolerable ſtrength, and afterwards perfectly recovered.

This antidote ſhews the nature of the poiſon, and there is no doubt but the ſame will prove effectual againſt any others of this kind, which, without an inflaming quality, ſtupify, and ſtop the motion of the nervous fluid.

BITTER ALMONDS.

BITTER Almonds are poiſonous to animals, particularly to *birds*. In the human body, they act as reſolvents and aperients. In emulſion or with ſugar they are diuretic, and an anthelmintic; but ſpirits, flavoured with bitter almonds, have proved poiſonous to the human ſpecies. It has been experienced, that ten drops of a *red oil* (like to that of the laurel, of a kernelly flavour and taſte) diſtilled in the ſame manner from *bitter almonds*, (after the ſweet oil has been expreſſed) mixed with an ounce of common water, in like manner, will kill a dog in about half an hour.

KERNELS

OF

BLACK CHERRIES.

KERNELS of *Black Cherries*, afford by diſtillation a water, in taſte and ſmell, not unlike to that from laurel, or bitter almonds: which, if drawn off very ſtrong, or over-impregnated with the heavy oil, will certainly cauſe the like bad ſymptoms. Some trials have proved this to be ſo, as it occaſions convulſions to a great degree, the very diſorder which waters of this kind have been found to produce.

The *yew tree*, *wild cucumbers*, and their juice, are deadly poiſons.

Water Crow-foot, if eaten, will cauſe a loſs of underſtanding, and the muſcles of the mouth and lips become ſo greatly convulſed, that the patient ſeems to laugh, although he is dying, which is termed the riſus ſardonicus.

It is proper to obſerve, that the poiſonous kind of *muſhrooms* are diſtinguiſhed by the under parts of them being either white or yellow, and they generally grow in marſhy places.

THE

MANCHINEAL TREE AND APPLE;

BY

JOHN ANDREW PEYSSONEL, M. D. F. R. S.

FROM

THE FIFTIETH VOLUME OF THE PHILOSOPHICAL TRANSACTIONS.

THE terrible effects of the tree called Manchineal, are known to all the world: its milk, which the ſavages make uſe of to poiſon their arrows, makes the wounds inflicted with them mortal. The rain, which waſhes the leaves and branches like boiling oil, cauſes bliſters to riſe; even the ſhade of the tree makes thoſe who repoſe under it to ſwell; and its fruit is eſteemed a deadly poiſon. I was informed, as a very extraordinary thing, that a breeding woman was ſo mad as to eat three of them, which did her very little harm; and this was looked upon as a miracle, and a proof of the ſurpriſing effects of imagination and longings of women with child. But here is a fact, which will ſcarce be credited by many perſons who have frequented theſe iſlands; which I declare to be true.

One Vincent Bianchi, of Turin in Piedmont, a ſtrong robuſt man, and an old ſoldier, of about forty-five years of age, belonging to the horſe, was a ſlave with the Turks eleven years, having been taken priſoner at the ſiege of Belgrade. He was one day walking by the ſea-ſide; and, ſeeing a great number of apples upon the ground, was charmed with their beautiful colours, and ſweet ſmell, reſembling that of the apple called *pomme d'apis:* he eat of them without reſerve; he found they had a ſubacid taſte; and having eaten a couple of dozen of them, he filled his pockets, and came home, eating the reſt as he went along. The negroes, who ſaw him eat the fruit, told him it was a mortal poiſon; upon which he ceaſed eating, and threw away the fruit that was left.

About four in the afternoon, viz. an hour after this repaſt, his belly ſwelled conſiderably, and he felt as it were a conſuming fire in his bowels. He could not keep himſelf upright; and at night the ſwelling of his belly increaſed, with a burning ſenſation in his bowels. His lips were ulcerated with the milk of the fruit, and he was ſeized with cold ſweats; but my principal negro made him a decoction of the

Leaves of the Ricinus * in Water,

And forced him to drink plentifully of it, which brought on a *vomiting*, followed by a violent *purging*; both which continued for four hours, during which time it was thought he would die. At length theſe ſymptoms grew leſs; and my negroes made him walk and ſtir about by degrees; and ſoon after they were ſtopped.

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* Avellana purgatrix; in French, medicinier.

Rice-gruel, which they gave him, put an end to all theſe diſorders; in four and twenty hours he had no more ailments nor pain; the ſwelling of his belly diminiſhed in proportion to his evacuations upwards and downwards, and he has continued his functions without being any more ſenſible of the poiſon. Sea water, with the juice of limes, and of the fig, and of the white wood tree, are effectual remedies for this poiſon.

COCCULUS INDICUS.

This is a little berry, about as big as a bay-berry, but more of a kidney-ſhape, having a wrinkled outſide, with a ſeam running lengthways, from the back to the navel. It is of a bitteriſh taſte; and is the fruit of the Natſiatam, bearing leaves in ſhape of a heart, and bunches of five leaved white flowers, which are ſucceeded by theſe berries. They grow in Malabar, in the Eaſt Indies.

SYMPTOMS.

The ſymptoms which they produce are a *nauſea*, *hiccough*, and *anxiety*.

ANTIDOTE.

A vomit, and drinking plentifully of honey and water, removes the complaint.

THE

AMERICAN ARROW POISON.

MR. de la Condamine mentions a ſpecies of poiſoned arrows, uſed by the Indians inhabiting the ſhores of the river of Amazons, which are ſimilar to thoſe uſed by the Indians on the coaſt of Guiana; and the poiſon with which they are envemomed, probably agrees in its principal ingredients with thoſe which enter the compoſition of the poiſon of Woorara, which is ſo called from a nibbee of that name, which is its principal ingredient. The Accawau Indians, who are here confeſſedly the moſt ſkilful in theſe lethiferous preparations, uſe only five ingredients; though the other nations, particularly the Arrowauks, make ſeveral whimſical additions, among which are the teeth and livers of venomous ſnakes, and red pepper, which laſt may perhaps ſerve to augment its activity.

The following is the recipe by which the Accawau arrow poiſon is uſually prepared.

Take of the bark of the root of Woorara, ſix parts; of the bark of Warracobba cowra, two parts; of the bark of the roots of Cowra-napi, Baketi, and Hatchybaly, of each one part.

Theſe ſeveral ingredients are all nibbees of different kinds.

All theſe are to be finely ſcraped, and put into an Indian pot, and covered with water. The pot is then to be placed over a ſlow fire, that the water may ſimmer for a quarter of an hour; after which the juice is to be expreſſed from the bark by the hands, taking care that the ſkin is not broke; this being done, the bark is to be thrown away, and the juice evaporated over a moderate fire to the conſiſtence of tar, when it is to be removed, and flat pieces of Cokarito wood are dipped therein, to which the poiſon, when cold, adheres, appearing like a gum of a brown reddiſh colour. The pieces of wood are then put into large hollow canes, cloſed at the ends with ſkins, and in this manner the poiſon is preſerved, until it is wanted to envenom the point of an arrow; at which time it is either diſſolved in water, and the points of arrows dipped in the ſolution; or the wood to which it adheres is held over the fire until it melts, and the points of arrows are then beſmeared with it. The ſmalleſt quantity of this poiſon, conveyed by a wound into the red blood veſſels of an animal, cauſes it to expire in leſs than a minute, without much apparent pain or uneaſineſs; though ſlight convulſions are ſometimes ſeen near the inſtant of expiration.

The poiſon, when thus inſpiſſated, is liquifiable by heat, and diſſoluble in water, in alcohol, in ſpirit of ſea-ſalt, and in a volatile alkaline ſpirit, as alſo in blood, ſaliva, &c. except only a very ſmall part, which ſubſides both in ſpirituous and aqueous menſtruums, and probably conſiſts in earthy particles foreign to the compoſition; it unites with acids without emotion, or change of colour. On mixing it with alkalies no ebullition is perceptible, but the colour changes from a reddiſh brown to a yellowiſh brown. A few grains mixed with as many ounces of human blood, warm from the veins, intirely prevents a ſeparation of ſerum and craſſamentum, and the whole maſs continues united in a ſtate of fluidity, ſimilar to that in which it is drawn, until after ſome days it putrifies.

How the inſtantaneous fatal effects of this poiſon can reſult from ſo ſmall a portion, as may be ſuppoſed to be left by the point of an arrow immediately extracted, is inexplicable: that it has the power of diſſolving the fluids is certain; but I am far from thinking, that its fatal effects are produced by any ſuch diſſolution. The Indians conſtantly moiſten the points of their arrows, when over dry, with the juice of lemons, which tends to produce an oppoſite effect; and blood drawn from the jugular veins and carotid arteries of animals, at the inſtant of their expiration by the effects of this poiſon, affords no uncommon appearance, and, after ſtanding, regularly ſeparates into ſerum and craſſamentum, with a greater degree of coheſion, than is uſually obſerved in ſcorbutic caſes; but yet the animals expired, as it were, by an inſenſible extinction of their vital flame. Can ſuch inſtantaneous fatality reſult from any change in the texture of the fluids, in ſo ſhort a ſpace? I doubt whether they are ſuſceptible of it: nor do I believe, that theſe ſudden deleterious effects can ariſe, except from an immediate injury offered to the ſenſible nervous ſyſtem, or the ſource of the vital functions. Mr. *Heriſſant* thinks it contracts the veſſels; but ſays, it does not uſually alter the appearance of the fluids, though he once or twice obſerved the blood to aſſume a browniſh colour.

Againſt this poiſon there is no certain antidote diſcovered; and its effects are ſo ſudden, that I doubt whether any thing taken by the alimentary paſſages can act with ſufficient celerity to preſerve life. Mr. de la Condamine, indeed, ſays, that ſalt*; but ſugar more certainly is an antidote for the Amazonian poiſon; and ſugar, or rather the juice of the ſugar-cane, is commonly thought by the white inhabitants of this colony, to prevent the effects of the Accawau poiſon; but the Indians themſelves do not acknowledge that quality in the cane. Dr. Heriſſant, however, affirms, that an actual cautery immediately applied to the poiſoned wound prevents its effects.

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* Salt is not to be found near the river of the Amazons.

FROM THE

CAROLINA GAZETTE, May 9, 1750.

TO THE PRINTER.

SIR,

I AM commanded by the Commons houſe of Aſſembly to ſend you the encloſed, which you are to print in the Carolina Gazette as ſoon as poſſible: it is the Negro-Cæſar's cure for Poiſon; and likewiſe his cure for the bite of a Rattle-Snake: for diſcovering of which, the general aſſembly hath thought fit to purchaſe his freedom, and grant him an allowance of 100 l. per ann. during life.

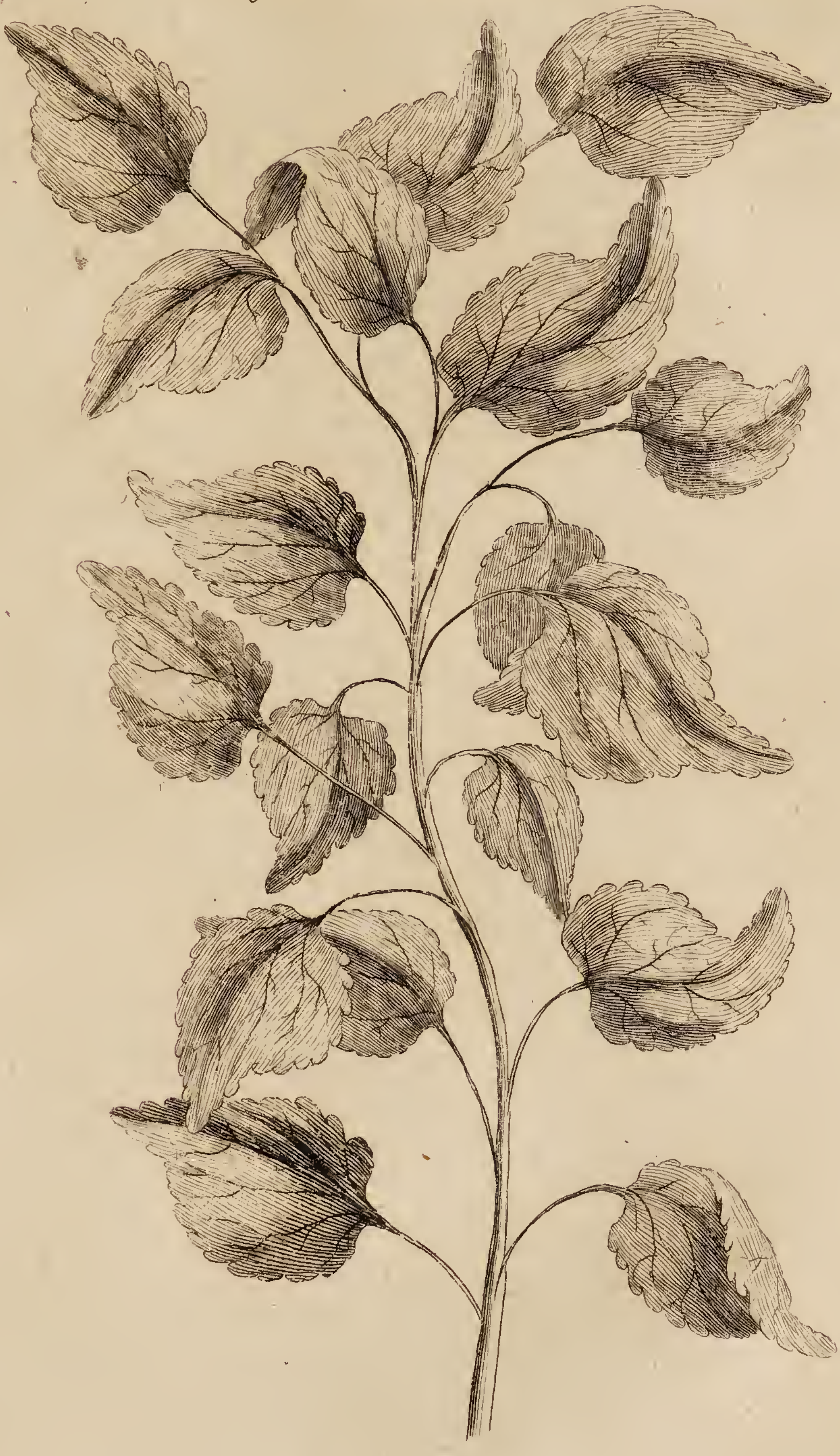
I am, &c.

JAMES IRVING.

The Negroe-Cæſar's cure for Poiſon.

Take the roots of plantane and wild horehound, freſh or dried, three ounces, boil them together

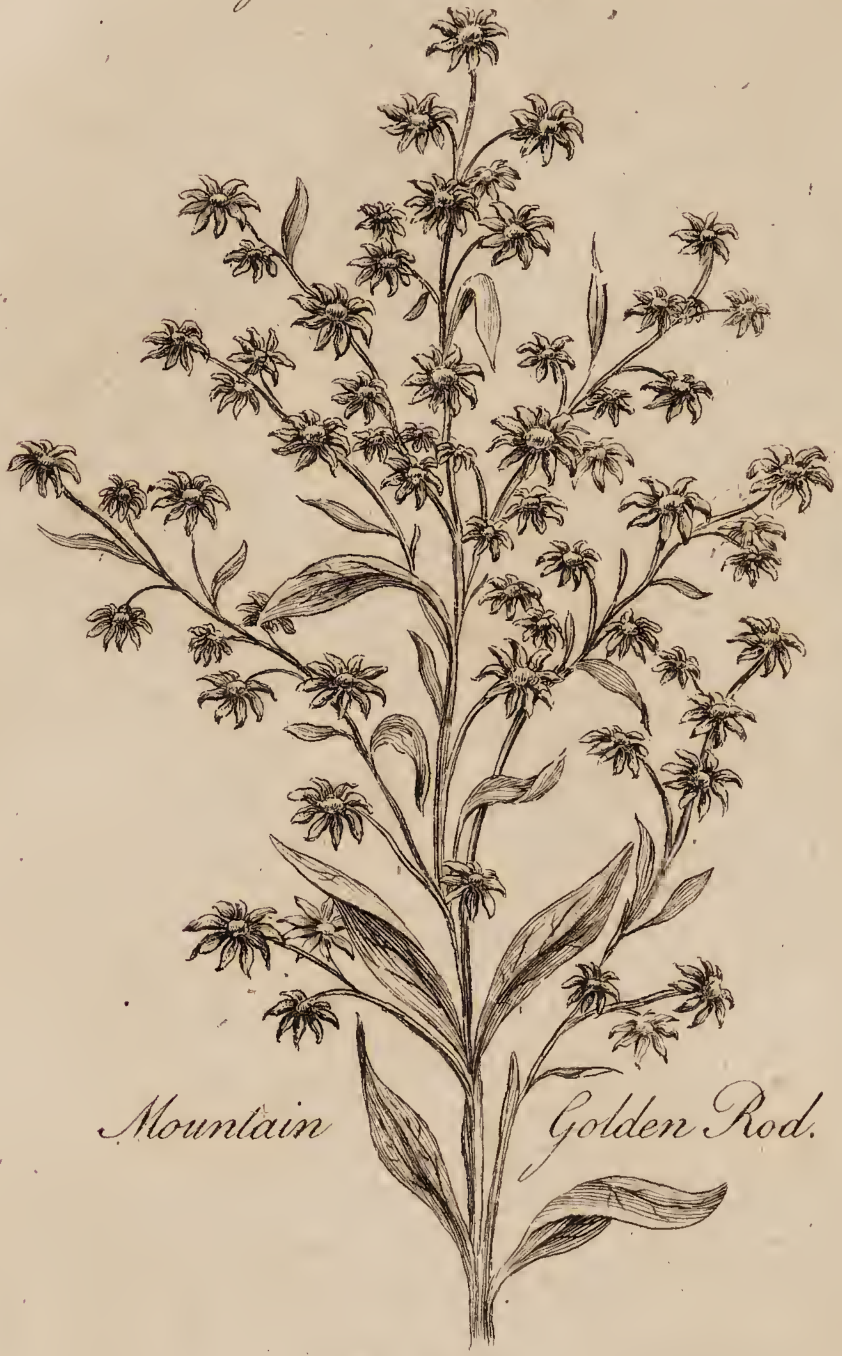
Negro Antidote for Poison.



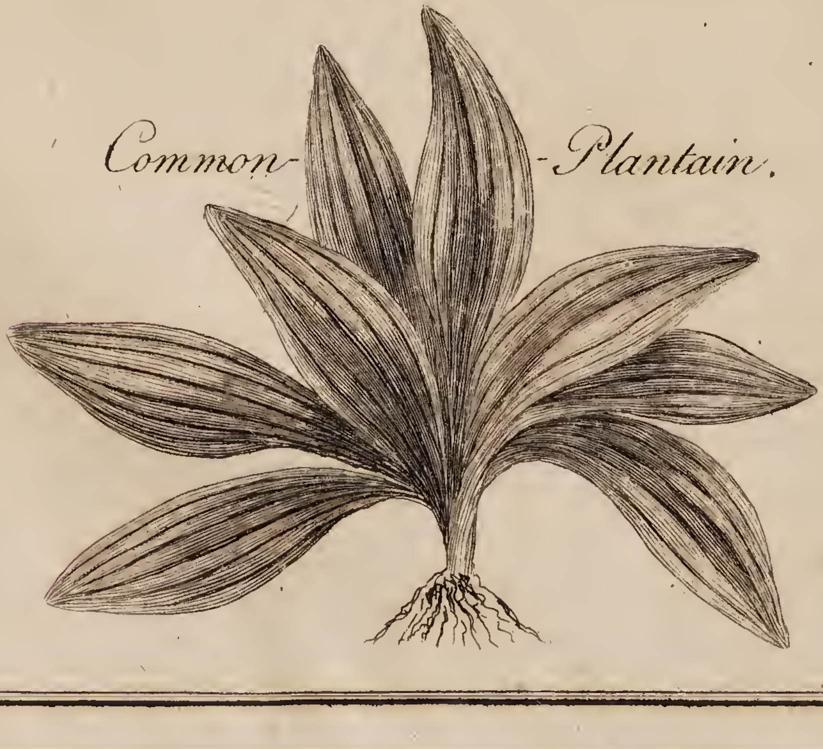
Black or Wild Hoar Hound.

Prestrich del. Royce ſculp.

Negro Antidotes for Poison.



Mountain Golden Rod.



Common-Plantain.

Prestwich del.

Royce ſculp.

together in two quarts of water to one quart, and ſtrain it; of this decoction let the patient take one-third part three mornings faſting ſucceſſively, from which, if he finds any relief, it muſt be continued till he is perfectly recovered: on the contrary, if he finds no alteration after the third doſe, it is a ſign that the patient has either not been poiſoned at all, or that it has been with ſuch poiſon as Cæſar's antidote will not remedy, ſo may leave off the decoction.

During the cure, the patient muſt live on a ſpare diet, and abſtain from eating mutton, pork, butter, or any other fat or oily food.

N. B. The plantane or hore-hound will either of them cure alone, but they are moſt efficacious together.

In ſummer, you may take one handful of the root and branches of each, inſtead of three ounces of the roots of each.

For

For DRINK, during the CURE, let the Patient take the following.

Take of the roots of golden rod ſix ounces, or in ſummer two large handfuls, the roots and branches together, and boil them in two quarts of water to one quart, (to which alſo may be added a little horehound and ſaſſafras) to this decoction, after it is ſtrained, add a glaſs of rum or brandy, and ſweeten it with ſugar, for ordinary drink.

Sometimes an inward fever attends ſuch as are poiſoned, for which he orders the following.

Take a pint of wood-aſhes, and three pints of water, ſtir and mix them well together, let them ſtand all night, and ſtrain or decant the lie off in the morning, of which ten ounces may be taken ſix mornings following, warmed or cold, according to the weather.

Theſe medicines have generally no ſenſible operation, though ſometimes they give a gentle ſtool.

The SYMPTOMS attending ſuch as are POISONED, are as follow.

A pain of the breaſt, difficulty of breathing, a load at the pit of the ſtomach, an irregular pulſe, burning and violent pains of the viſcera above and below the navel, very reſtleſs at night, ſometimes wandering pains over the whole body, a reaching and inclination to vomit, profuſe ſweats (which prove always ſerviceable) ſlimy ſtools, both when coſtive and looſe, the face of a pale and yellow colour, ſometimes a pain and inflammation of the throat, the appetite is generally weak, and ſome cannot eat at all; thoſe who have been long poiſoned, are generally very feeble, and weak in their limbs, ſometimes ſpit a great deal, the whole ſkin peels, and the hair falls off.

CÆSAR'S

CÆSAR'S Cure for the Bite of a RATTLE-SNAKE.

Take of the roots of plantane, or hore-hound* (in the ſummer, roots and branches together) a ſufficient quantity, bruiſe them in a mortar, and ſqueeze out the juice, of which give, as ſoon as poſſible, one large ſpoonful; if he is ſwelled, you muſt force it down his throat: this generally will cure; but if the patient finds no relief in an hour after, you may give another ſpoonful, which never fails. If the roots are dried, they muſt be moiſtened with a little water.

To the wound may be applied a leaf of good tobacco, moiſtened with rum.

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[*] Wild, or black hore-hound.

As a Confirmation of the Efficacy of the above Negro remedy for Poiſon, we ſhall relate the ſurprizing Cure performed by that Antidote, on Mr. ——, of Dublin, who was poiſoned with a mixture of Spaniſh Flies, or Cantharides, and White Arſenic, in a reddiſh liquor, reſembling Red Port Wine.

On Saturday, March 31, 1770, as I was returning home about 8 o'clock in the Evening, having ſpent the afternoon with ſome friends, I met Eleanor Roſe, who, preſſing me to drink tea with her, which with reluctance I conſented to do: having filled a tea-cup, ſhe aſked me if I could drink it without cream, as ſhe had none; but recollecting (as ſhe ſaid) a veſſel, in which there had been milk, ſhe took the cup and the candle to an inner room to drain the veſſel in the tea; after ſome time ſhe returned, and laid the cup down, deſiring me to drink it, and went back with the candle into the other room; as I had not any light, I delayed drinking it till ſhe returned, which ſhe ſeemed to do with reluctance. I was then ſurprized at the high colour of the tea, and aſked her, what ſhe had done to make it ſo high coloured? She anſwered, it was only the ſtrength of it with ſtanding ſo long, and ſeemed diſpleaſed at my finding fault, ſaying, do you think that I put poiſon in it. I replied no, but that I would not drink it, for there was ſomething in it not right. She then took the cup, and ſipped the liquor, but ſpit it out immediately, ſaying it was like ſyrup, and that ſhe would drink it herſelf if it was not ſo ſweet; and as it was grown cold, ſhe would put ſome warm tea to it. At length, by many intreaties, ſhe prevailed on me to drink it all but the grounds, which I threw behind the fire: my ſtomach immediately turned, and my head ſhook, owing to the diſagreeable taſte it left on my mouth: I felt an inſtant inclination to vomit, with a great ſickneſs. The reaching increaſing, I put my finger in my throat, on which I threw up a large mouthful of a nauſeous blackiſh ſtuff. I then was ſeized with an unuſual tremor, like the cold fit of an ague, and a prodigious cold ſweat over my whole body, particularly on my face, alſo with a violent pain in my breaſt, and I became ſo cold, that I was almoſt numbed, although oppoſite a good fire. The trembling increaſed ſo much, that my knees ſhook under me, my teeth gnaſhed, and in a few minutes I fell motionleſs on the floor; on which ſhe was much frightened, and went out on the ſtairs, and called one William Martin to her aſſiſtance (whom I believe acceſſary to this buſineſs, from what happened after.) On entering the room, they found me in the above melancholy ſituation, incapable of ſpeaking, and gave me ſome ſalt and water, of which I drank plentifully. My bowels ſeemed as if they were parched, and they finding the ſhivering continue, put me into bed; and though all the bedclothes that could be got was laid over me, yet the ſhivering continued extremely violent. I endeavoured to compoſe myſelf, and at aſt got a little doze, but ſhortly after was rouzed again, by the pain in my belly growing ſo exceſſive bad, that my bowels ſeemed as if tearing aſunder, alſo pains all over my body. Theſe complaints increaſing, the intolerable torment I ſuffered, obliged me to riſe at the break of day, the pain made me ſhed tears, and my belly was now greatly ſwelled, ſo that I preſſed againſt the back of a chair for eaſe. She ſeeing me in this miſerable condition, wou'd have got for me ſome burned Geneva, which ſhe ſaid was good for a cholic, but I rather choſe to take a glaſs of *Rum*, in which ſome *Rhubarb* had been ſteeped with a little ſaffron, made hot. Accordingly I took a glaſs of this mixture; and ſhe ſaid I had a ſtrong ſtomach, and nothing would kill me.

After I had taken this I found myſelf ſomething eaſier, and in an hour after the ſwelling in my belly and pain abated.

April 1. This day I found myſelf very low and melancholy, which I attributed to my having been much purged by taking the rum, &c. April 2, I took another doſe, but not ſo ſtrong as at firſt, as I found myſelf weak, and in the morning inclined to vomit, but could not bring up any thing, though the efforts to vomit were ſo great as to make the ſweat pour off my face. This morning I found, on making urine, that my ſemen involuntarily flowed from me, of a greeniſh hue, which alarmed me, altho' I felt no pain (I told her of this, but ſhe laughed, and ſaid, that I had hurt myſelf by running, &c.) In this manner I continued, growing very weak, and took another doſe of rum, &c. which purged me gently, and obſerved, that the urine I made at night appeared in the morning like the curds of ſkimmed milk, when boiled, and my ſemen ſtill continued to be diſcharged involuntarily, but not in any great quantity. About three or four days after, the fleſh and nails of my fingers appeared as if they had whitloes; and on the 10th of April, the nails of my fingers and toes began to grow black, and the two middle fingers of my right hand in two days after ſwelled and broke out in blue ulcers, in the middle and upper joints, the firſt joint of my left thumb and fore finger became alſo ulcerated; both my hands were ſtiff and numbed, and a blue bliſter appeared on the great toe of my left foot. I began now to grow exceſſive low and weak, and to loſe my appetite; my tongue and throat very ſore, my gums ſwelled, with great pain, and the roof of my mouth in ſmall white bliſters; the veins under my tongue ſwelled to a great degree, and the blood almoſt ready to burſt through the veſſels, and of a black colour, a difficulty in making water, my eyes itching and inflamed.

I was alſo reſtleſs at night, and unable to lie in one poſture for five minutes together; my throat very ſore, ſo that I could not eat any thing but ſpoon meats, and even with difficulty could ſwallow liquids, which gave me great pain. The ulcers on the joints of my fingers exceeding ſore, which diſcharged a corrupted matter, mixed with blood, a great itching and ſoreneſs, accompanied with a pain and inflammation in my eyes, (which I bathed with rum and water) and from the firſt time I took the rum and rhubarb, a continual diarrhæa. Finding my health declining, and an entire loſs of appetite and ſpirits, &c. and the other miſerable ſymptoms increaſing, and being a ſtranger to the cauſe of them, I told Eleanor Roſe I would go to a phyſician, and enquire what was the reaſon of this alteration in my body and health; which, when ſhe found I was determined on, ſhe and William Martin eſcaped together (as I was informed) out of the kingdom on the

18th of April, and in my abſence, at the ſame time, robbed me of every thing they could carry off. The ſymptoms rather increaſing I was in a deſperate ſituation, greatly emaciated, with a ſenſible pain in my breaſt, a hard lump internally in the right ſide of my belly, attended with a pricking pain, a copperiſh taſte in my mouth, and at times a dizzineſs in my head. Sunday April 22, my eyes very heavy, itching and ſore, and my colour changed from ruddy to yellow, as if I had been afflicted with the yellow jaundice; walking out to ſee what the air would do for me, I met a friend, who was ſurpriſed at the great alteration in me, and ſaid, if I choſe it he would carry me to a ſurgeon of his acquaintance. I conſented, and he examined my mouth and throat, which gave me great pain; he told me my mouth was full of white bliſters, and my throat ulcerated, and declared from the appearances, that I had taken ſome poiſon, which he believed was Cantharides, from the ſymptoms which I laboured under. He ordered me to gargle my mouth and throat with Barley-water, ſweetened with Honey of Roſes, to drink of the beſt Wine, and to come to him the next morning. On leaving him I went to my parents, and acquainted them with my melancholy ſituation, who immediately ſent me to Doctor Lucas, who examined my throat, fingers, &c. and having informed him of the ſeveral particulars, as recited in the former part of this narrative, he declared I had been poiſoned with Spaniſh flies (or cantharides) and ſome mineral poiſon mixed with them, and that, had I not been fortunate enough to throw up that nauſeous mouthful the firſt night, and take the rum, &c. next morning, I ſhould have died in 48 hours. He ordered me the following Electuary, viz.

Mithridate, half an ounce; Virginian Snake-root, and Contrayerva-root, of each two drachms; Choſen Rhubarb, one dram; Syrup of Saffron, a ſufficient quantity to make an electuary, the bigneſs of a nutmeg to be taken three times a day, viz. morning, noon, and at night going to bed; to ride in the morning, and drink new milk from the cow, and after dinner to drink a pint of wine. This day I was very ill, the ulcers on my fingers very bad, my tongue, mouth and throat very ſore and painful, a conſtant reaching to vomit, exceſſive pain in my bowels, and ſoreneſs on the right ſide of my belly, the involuntary emiſſion of *ſemen* in *coagulated* lumps ſtill continuing, my hair falling off, the palms of my hands full of white ſmall ſpots, the ſkin breaking in ſeveral places, a great dizzineſs, at times, a loſs of ſight for ſome ſeconds, and a total chillineſs all over my body, my ſkin diſcoloured with red, blue, green and blackiſh little round ſpots, my teeth ſoft like horn.

April 24, I took the electuary, the effects of which were, a great evacuation of high-coloured fetid urine, ſlimy ſtools, and profuſe ſweats, ſo great as to wet the bed and bed-cloaths, which were obliged to be dried every day; the torment I endured in the night, continued inexpreſſible, from the violent pricking pains in my bowels, my gums ſwelled and inflamed, and diſcharging therefrom blood and water of a copperiſh taſte, and intolerable pains in my breaſt. My pains were always violent at night when in bed, for in the day I ſcarcely felt any pain, except the exceſſive chillineſs which I have already mentioned.

In this deſperate ſituation I laboured upwards of five months, ſeldom ſleeping in the night, but watering my pillow with tears.

I continued to take the electuary, and in ſome time found myſelf rather better, as the ulcers began to heal, but the other ſymptoms ſtill continued, and my weakneſs increaſed. The doctor finding my caſe ſo deſperate, (after my taking nine pots of the electuary) told me I muſt have a perſon of ſkill to aſſiſt him, as my ſituation required the utmoſt care to preſerve my life, as by this time I threw up from my lungs lumps of a black ſlimy nature. N. B. This ſymptom continued till I took the Negro Cæſar's medicine. I then applied to one Mr. Doyle, a ſurgeon, whom I informed what I had taken by the direction of Dr. Lucas; he ſeemed ſenſibly affected with my deſperate caſe, aſſuring me, that no care of his ſhould be wanting to ſave my life. He ordered me a doſe of *Glauber ſalts*, to be taken the next day; and the day after wrote the following preſcription for me, which was made up by Mr. Pannel, apothecary, in Capel-ſtreet, Dublin.

℞ Mixtur. mercurial. gummos. et balſamic. Capt. Cochlecare mane et nocte *; of which I took a ſpoonful morning and night for eight or nine days, which entirely healed the ulcers, only leaving blackiſh marks, which next turned blue, and in time red. The medicine purged me ſeverely, with ſlimy ſtools quite white; he then gave me another doſe of *Glauber ſalts*; I now began to mend ſurprizingly, and was ordered to take the following decoction to heal my bowels, viz.

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* This, as we ſuppoſe, was a mixture of equal parts of a ſolution of quickſilver in mucilage of gum arabic, and of the common pectoral emulſion.

A good quantity of Comfrey root, boiled in new milk. To take one pint as warm as poſſible, morning and night.

Having ſtill a great dizzineſs in my head, ſo as to make me ready to fall, and a dimneſs in my ſight, at times for about half a minute, he ordered me to *bathe* in the *ſea*. The firſt of Sept. the ſame gentleman gave me ſome nervous pills, two to be taken at night and morning, alſo an *electuary*, much the ſame as that preſcribed by Dr. Lucas, but with the addition of the abſorbent powders; alſo the following decoction, viz.

Fumitory boiled on whey.

To be drank a pint faſting in the morning, and the ſame at going to bed. This, with the pills, removed the giddineſs and loſs of my ſight, exceſſive ſweating at night, and soreneſs of my gums, for which he preſcribed a doſe of *Glauber ſalts*, and adviſed me to chew *rhubarb* conſtantly; this, and bathing in the ſea, I continued until the latter end of September; when beginning to grow reſtleſs at nights, eſpecially as ſoon as warm in bed, and all my former ſymptoms to return, I was ordered the following infuſion, viz.

Lime water, three quarts: Lignum Vitæ, four ounces; Liquoriſh root dried, two ounces.

To drink half a pint going to bed, and in the morning; ſtill evacuating involuntarily my ſemen in ſmall coagulated lumps, and finding no benefit from this infuſion, I was ordered to chew *rhubarb*, and drink a decoction of Sarſaparilla, Gentian root, and Lignum Vitæ.

Finding no benefit, but growing reſtleſs at night, and my ſymptoms returning, alſo my hair falling off again my hands and arms when cold, which was generally attended by a trembling, my ſkin being mottled with blue and black ſpots, I was much alarmed; and being adviſed to try the Negro Cæſar's cure to expel poiſon, I did ſo, ſtrictly obſerving the rules enjoined.

October 14, I began taking the Negro medicine. The effects were, this day, three ſtools of a pure white ſlime, and a great diſcharge of red urine, which ſmelt like burnt rags, but I ſlept better this night than I had done before; after the third doſe I found an entire alteration for the better. My mouth and gums were healing; the pain in them, my breaſt, and my bowels gone. I now began to ſleep as well as ever, and came to my appetite amazingly. Finding ſo great benefit by it, I took the medicine again, but it did not cauſe ſo great an evacuation of urine as the firſt time, and my ſtools were not ſo ſevere; this I imagined to proceed from the *golden* *rod*, which I now uſed, being of a different kind; this being the garden kind, with long leaves like a broad graſs; and the firſt was the mountain kind.

On the 24th of March I repeated the Negro medicine, having perceived ſome ſigns of a return of my complaints, making uſe of another kind of golden rod, with leaves like ſorrel, the plant grows high, and is of the garden kind; this proved a more powerful diuretic than either of the former, but I look on the mountain kind to be the beſt. From the time of my ſwallowing the poiſon, to my taking the negro antidote, the ſecond time, I had a continued looſeneſs, which reduced me to a ſkeleton; and from my firſt taking that medicine I began to recover, and daily gathered ſtrength, health, and ſpirits; for which I thank God, who by his providence reſcued me from the death, by which the moſt villainous of women attempted to deſtroy me, in this moſt cruel and tormenting manner.

The following account of the Indian poiſon, and the method of curing the terrible ſymptoms which reſult from it, is tranſlated from a manuſcript of Dr. Iſaiah Burgeſs, who practiſed phyſic many years in the Indies, and conſequently had the beſt opportunity of acquiring the ſecret.

The Negroes and Indians uſe a poiſon of a ſtrange extraordinary nature; the doſe is very ſmall, it has no ill taſte, ſo that mixed with meat or drink it is not perceivable; it cauſes divers ſymptoms, and the effect is various, according as the doſe is large or ſmall; it kills ſometimes in a very few hours, ſometimes in ſome months, and, at others in ſome years; the ſymptoms are according to the quantity given; if great, it cauſes evacuations upwards and downwards; of excrements firſt, then of the humours, and laſtly of blood, with fainting fits and ſweatings. Death enſues in ſix or ſeven hours. The negroes change of a white colour.

If the doſe be but ſmall, the ſick perſon loſes his appetite, feels pains in his head, arms, and limbs, a wearineſs all over, ſoreneſs in his breaſt, and a difficulty of breathing, languiſhes, and at laſt dies.

All remedies, yet publicly known, are of no efficacy againſt this poiſon, and the miſerable patient certainly dies. Nay, I queſtion whether the beſt cordial remedies can put the leaſt ſtop to the efficacy of its venom, or retard death longer, than the time fixed by the artful poiſoner from the largeneſs of the doſe.

I am not ignorant, that the *Spaniards* are acquainted with this very poiſon, having ſeen ſeveral Buccaneers die of it, to whom it had been adminiſtered by *Spaniſh women.*

I am alſo perſuaded the ſame poiſon is uſed in Spain and Italy.

This poiſon has but one ſpecific antidote yet known, the knowledge of which coſt me very dear; and it was with much difficulty I could perſuade a famous negro poiſoner to part with his ſecret.

CURE OF THE INDIAN POISON.

The antidote is the root of the *ſenſible plant*, as it is commonly called, or herba ſenſitiva. It grows like a ſhrub, has no prickles, flowers yellow, and bears little cods, full of ſmall black pretty ſeeds, of which the Indian women make necklaces and bracelets. Uſe none of the root, but what is under ground; waſh it well, and ſplit it in two. Take a good handful of theſe roots ſo ſplit, and ſteep them in three quarts of wholeſome clean water, in an earthen glazed pot, having a cover. Apply but a moderate fire, that it may boil very gently. The decoction has no ill taſte, and you may either take it ſo, or add ſugar, as you ſhall think beſt. Give the patient a good glaſs of this decoction, as warm as he can drink it; an hour after give him another, and ſo for ſome time, as you ſhall think it neceſſary to make a perfect cure. There is no danger of giving too much, it can do no harm. Several people have taken this decoction, though they have not been poiſoned, thinking it would relieve them from other diſtempers; ſo that one who ſuſpects he has had ſome of that poiſon given him, may drink it very ſafely, and in what quantity he pleaſes. The reſt of the plant is to be rejected as bad and noxious.

The Doctor enforces his obſervations by remarking, that he had been a practitioner in theſe parts for above twenty-five years. Many negroes, he ſays, were wonderfully preſerved and cured, by taking of this antidote, though, for brevity's ſake, he gives but one inſtance, which is of a ſtrong negro man about thirty years of age, and in perfect health, who, being one night at a plantation, four miles diſtant from that where he lived, was invited to drink a dram of rum, by another negroe, who mixed poiſon with it. The fellow drank it up, perceiving nothing unuſual in it, but as he was taking leave, on the other's bidding him farewel, and telling him he ſhould never ſee him again, he ſuſpected he was poiſoned; and, putting his finger in his mouth, vomited up great part of the poiſon, though there ſtill remained enough to cauſe continual evacuations upwards and downwards, of excrements firſt, then of humours, and laſtly of blood. As he was coming home, he fainted away ſeveral times; and calling at length at ſome neighbouring negroe houſes, was brought home extremely altered, having turned white, and being thought to be expiring. The root was immediately ſent for, and the decoction made, and given him in great quantities. He continued taking it for three or four days, and on the fifth went to work along with the reſt of the negroes.

Thus far, the ingenious author:—and we muſt obſerve, that the ſenſible plant is endowed with the property of reſiſting poiſon.

For the honourable Sir Hans Sloane, whoſe writings will always remain an honour to his country, has obſerved from Piſo, "that the root of this ſhrub is an antidote againſt the ſhrub itſelf," which is very poiſonous, and kills by degrees, making the unhappy ſufferers cachectical, ſhort-winded, and melancholy, till they die. This greatly corroborates what our author has advanced, and it is obſervable, that Sir Hans Sloane likewiſe directs all parts of the plant, except that part of the root which is in the ground, to be rejected as noxious; though, whether this be exactly the ſame plant with that which our author mentions, I dare not determine, as Sir Hans Sloane enquires, whether it be not the æſchynome, ſeu mimoſa arboreſcens Americana, &c. flore albo; whereas Dr. Burgeſs expreſsly ſays, that it flowers yellow; though this may poſſibly be a miſtake in him.—I am ſenſible it may be objected, that the negroe poiſon may be of various kinds; and that therefore this remedy, though ſo extraordinary a ſpecific in ſome caſes, may be unavailable in others. That the negroes may have the knowledge of different ſorts of poiſon, I deny not; but from the univerſality of the effects of this medicine, as the Doctor affirms, that many have been wonderfully cured and preſerved by it, and does not mention a ſingle inſtance of its miſcarriage, it appears as if the negroes in the Weſt-Indies uſe but one kind of poiſon; or if they uſe different kinds, yet ſuch only which come within the power of this remedy. Beſides, as we cannot be aſſured, but by the conſequence, whether the poiſon be of ſuch a ſort, as to be within the reach of this remedy, or not, I think there is all the reaſon in the world, it ſhould be adminiſtered under any ſuſpicion of the Indian poiſon, eſpecially as the Doctor aſſures us of its extreme innocence; and I believe every one will readily agree, it is no ſmall recommendation of a medicine, that whatever its good effects may be, it cannot poſſibly do harm.

THE CARUNA NUT.

The *Caruna*, as it is termed by the Indians, ſays Mr. Bearcroft in his deſcription of Guiana, is the poiſon nut of a ſmall tree, or ſhrub, covered with a thin brown bark, and having ſmall, oval, light green leaves. From the extremities of the branches ariſe ſeveral reddiſh coloured bloſſoms, which are afterwards ſucceeded by the nuts. Theſe nuts, deprived of their external huſky teguments, appear in the form of the American anacardium, being about ten lines in length, five in diameter in the middle, and four near each end, where they bend ſomewhat inwards. Each nut has a large brown ſhell, conſiſting of four pieces, which are joined laterally and longitudinally,

nally, but the circular longitudinal juncture is conſiderably nearer to the one end than the other, and thereby affords room for a cavity towards the end, which is fartheſt from this juncture. Within this cavity is contained a farinaceous, ſomewhat oily kernel, equal in ſize to that of an hazle-nut. The ſubſtance of this kernel is a ſlow but moſt fatal poiſon, and is ſaid to be a principal ingredient in the compoſition of a white farinaceous poiſon, in the hands of the *Accawau* tribe, which they ſometimes conceal under their nails, at their meetings, when they intend to revenge an injury, until an opportunity offers of putting it into the drink of the deſtined victim of this ſecret and ſlow, but fatal vengeance.

ANIMAL POISONS.

The Bites of Men in Anger, and Mad Animals.

Canine Madness, of which the Hydrophobia is a ſymptom.

Bite of a Rattle Snake.

—— Viper.

—— Scorpion.

—— Scolopendra or Centipes.

—— The Spider of Apulia.

—— The Spider Nhamdu.

—— Sting of a Bee.

—— —— Asps.

—— Gecco, or Indian Lizard.

—— Serpent Cobres de Capello.

Poison of a Toad.

Cantharides.

A Species of Caterpillars of the Fir-Tree.

OF

ANIMAL POISONS.

THE venom which is communicated by the ſtings or bites of animals, chiefly owes its origin and nature to a violent affection of the mind, ſuch as extreme and continued anger: for ſuch is the nature of the paſſions of the mind, that they affect the nervous fluid, and by that means the whole compages of the nerves and membranes, and greatly prevent all the vital motions of the ſolids and fluids, as well ſecretory as excretory, in which the force or effects of a real poiſon are contained. Hence it appears, that there is no difference between a poiſon and a violent paſſion of the mind, as to their efficacy, force, and effects. Thus we have inſtances of the bites of men in anger being fatal; and I have read of one in particular that was attended with purple ſpots, convulſions, and a delirium, which ended in death. The venom of animals, whether in a rage or madneſs, communicates an infection not only by the ſaliva, milk, and lymph, but by the ſemen, whence women have received the contagion from their huſbands, of which Hoffman ſays, he knew one remarkable inſtance.

OF

CANINE MADNESS.

THIS diſeaſe is moſt frequent after long, dry, hot ſeaſons; and ſuch dogs as live upon putrid ſtinking carrion, without having enough of freſh water, are moſt liable to it.

When any perſon is bit by a dog, the ſtricteſt enquiry ought to be made whether the animal be really mad. Many diſagreeable conſequences ariſe from neglecting to aſcertain this point. Some people have lived in continual anxiety for many years, becauſe they had been bit by a dog which they believed to be mad; but, as he had been killed on the ſpot, it was impoſſible to aſcertain the fact. This ſhould induce us, inſtead of killing a dog the moment he has bit any perſon, to do all in our power to keep him alive, at leaſt till we can be certain whether he be mad or not.

Many circumſtances may contribute to make people imagine a dog mad. He loſes his maſter, runs about in queſt of him, is ſet upon by other dogs, and perhaps by men. The creature, thus frightened, beat, and abuſed, looks wild, and lolls out his tongue as he runs along. Immediately a crowd is after him; while he finding himſelf cloſely purſued, and taking every one he meets for an enemy, naturally attempts to bite him in ſelf-defence. He ſoon gets knocked on the head, and it paſſes currently that he was mad, as it is then impoſſible to prove the contrary.

We may eaſily diſtinguiſh a dog to be mad by his dull and heavy look, by his endeavouring to hide himſelf, and ſeldom or ever barking; and yet he is angry and ſnarls at ſtrangers, and fawns and leaps on his owner; by his refuſing meat and drink, his drooping and hanging down his ears and tail, and lying down as if going to ſleep; this is the firſt ſtage of madneſs, which is dangerous, though perhaps not ſo infectious.

Soon after this he begins to breathe quick and heavy, lolls out his tongue, ſlavers a good deal, and foams at the mouth; looks half aſleep, flies ſuddenly at the by-ſtanders, and runs forward in a curve line.—— Theſe ſymptoms increaſe, and he knows not his owner; his eyes are thick and dim, and water, like tears, runs from them; his tongue is of a lead colour; he grows faint and weak, and often falls down; then riſes and attempts to fly at ſomething, grows mad and furious. This is the laſt ſtage, in which he ſeldom lives above 30 hours. The nearer the dog is to this ſtate, the more dangerous is the bite, and the more direful its effects. *The ſmalleſt quantity of this ſaliva either freſh or dried, or in any way communicated, has produced the diſeaſe, with all its frightful ſymptoms.* It may ſometimes lie dormant; but is brought into action, with great fury, after ſome time.

Two other circumſtances which Boerhaave has omitted are, 1ſt, that all other dogs, on ſmelling the dog going mad, will avoid him, and run away with ſigns of horror. Secondly, that the dog's voice, when he barks, will be quite altered from the natural tone, and ſeem hollow and hoarſe. And though, as the ſame author obſerves, the dog may be mute in the dumb madneſs; yet it is more frequently found, that a dog, eſpecially if confined, ſhall bark for a day or two together without ceaſing.

A certain experiment, to aſcertain whether a dog that has been killed was really mad or not.

When a dog is killed upon ſuſpicion of being mad, without an abſolute certainty, rub a piece of dreſſed meat on the teeth and gums of the dead dog, and when this is offered to another dog, if the dog which was killed was mad, the other will refuſe it with great terror, otherwiſe he will eat it.

The ſymptoms attending the bite of a mad dog.

There is no poiſon known which produces ſuch terrible effects, as that communicated by the bite of a mad animal; nor which induces ſuch a change in the perſon who receives it; or which rages with ſuch violence, and ſo ſuddenly, when it once begins to act.

The part bitten firſt begins to be painful, then come on wandering pains, gradually, with an uneaſineſs and heavineſs, diſturbed ſleep, and frightful dreams, accompanied with toſſings of the body, ſudden ſtarting, and ſpaſms, ſighing, a love for ſolitude, and anxiety.

Theſe ſymptoms continue through the whole courſe of the diſtemper, increaſing daily, with the addition of a difficulty in breathing, horror, violent agitations on the ſight of water, or other kinds of liquids, or on ſeeing a looking-glaſs) great tumor, and loſs of appetite. They can ſwallow any thing which is ſoft and ſolid;

but when their lips come in contact with a fluid, they ſtart back in the greateſt fury and agony; they vomit a bilious matter; a fever, with great heat, comes on, attended with a continual watching, ſometimes with a priapiſm; the tongue becomes dry and rough, and often lolls out of the mouth; the voice becomes hoarſe; the thirſt is very conſiderable, and yet they cannot drink; or even bear the approach of any liquor. This ſymptom is not peculiar to canine madneſs alone. They endeavour to ſpit at the by-ſtanders, even involuntarily, with a deſire of biting thoſe they can come at; and yet have ſenſe enough to beg they would keep from them, for fear of an accident of that kind; they rage and foam at the mouth; they cannot bear to ſee a perſon dreſſed in ſcarlet clothes; their pulſe ſinks, and their breathing fails, and cold clammy ſweats come on, with convulſions, which finiſh the melancholy tragedy.

ANTIDOTES.

The wound ſhould be immediately enlarged, or entirely cut out; then apply a cupping-glaſs, with ſcarrifications; after which cauterize the wound, waſhing it daily with ſalt-water and vinegar, or ſalt diſſolved, and keep it open with eſcharotics. Some prefer rubbing the wound daily with the ſtrong mercurial ointment.

Bleeding is recommended by many to eight or twelve ounces; but that is not neceſſary, unleſs the patient be of a plethoric habit.

Emetics may be very proper; and at night, take of the beſt muſk, ſixteen grains; of native cinnabar finely levigated, half a drachm; of the ſaponaceous pill, eight grains; camphor ſix grains; mix the whole into a bolus, with balſam of Peru, which is to be taken at night going to reſt.

Early the next morning, take of the infuſion of ſenna, three ounces; tincture of ſenna, half an ounce; Glauber's purging ſalt, three drachms; ſolutive ſyrup of roſes, two drachms; mix into a draught for one doſe.

The ſame evening, or the next day, let the patient go into a cold bath, or be dipped in the ſea, then be rubbed dry, and put to bed, repeating the muſk bolus, with lbſs. of an infuſion of valerian and ſaſſafras, with as much warm ſmall white-wine whey as he can drink, to encourage ſweating. — This ſhould be repeated, together with bathing, &c. ſucceſſively for four, ſix, or ſeven nights, if the animal was raving mad, and for three or four nights at the next full moon, and the change. The morning after this courſe, order the cold bath and friction; and then the patient may follow his ordinary vocations, taking care only that he gets no cold.

In caſe the Hydrophobia, or dread of water, has ſeized the patient before aſſiſtance has been had, bleed almoſt ad deliquium animi; then proceed in the above method, enlarging your doſe of opium to the quantity of two grains, and apply a galbanum plaſter, with ℥ſs of opium to the fauces; this muſt be repeated or leſſened, as occaſion requires. Mercurials have been ſtrongly recommended, as efficacious in this melancholydiſorder, and, in my opinion, not without the appearance of reaſon. As the following receipt has ſomething remarkable in it, I have thought it may be uſeful, to give it a place in this work. The original receipt is in Cathorp church in Lincolnſhire, from which this is taken. The whole town being bitten by a mad dog; all who took this medicine did well, and the reſt died mad.

For the Bite of a MAD DOG.

Take the leaves of rue, picked from the ſtalks and bruiſed, ſix ounces; garlic picked from the ſtalks and bruiſed, Venice treacle, or mithridate, and the ſcrapings of pewter, of each four ounces: ſimmer theſe over a ſlow fire, in two quarts of ſtrong ale, till one pint is conſumed; then keep it in bottles ſtopped cloſe, and give of it nine ſpoonfuls to a man or woman, ſeven mornings together, faſting; and ſix to a dog. This, the author believes, will not (by God's bleſſing) fail, if it be given within nine days after the bite of the dog. Apply ſome of the ingredients, from which the liquor was ſtrained, to the bitten place.

Boerhaave affirms, that, in general, there is no certain preſervative againſt this diſorder yet known; and that there is no example that can be depended upon, of any one having been recovered, who was once ſo far gone as to dread water.

His directions are, firſt, that as ſoon as the poiſon is received into the body, the part affected, and thoſe adjacent thereto, ſhould have deep ſcarifications made in them. Then large cupping-glaſſes to be applied, or the part to be burnt pretty deep with the actual cautery, and afterwards kept in continual ſuppuration. During the whole of this time, the part is without interruption to be fomented with a pickle of ſea-ſalt and vinegar. Secondly, the cloaths, &c. which have come near the perſon to be thrown away. Thirdly, the patient is, immediately after receiving the misfortune, to be thrown headlong into the ſea, or ſome river, with threatening words, and other circumſtances capable of ſtriking terror into him; for which purpoſe he is frequently to be immerſed in the water, and again taken up; for the good effects are only produced by the dread and conſternation into which the mind is thrown. He is frequently to be purged with rhubarb, agaric, and the juice of elder bark. Fourthly, let the patient have a gentle ſweat excited every morning before eating. Fifthly, his feet and hands are to be daily fomented in a bath of water. Laſtly, let him frequently drink cold water, till he vomits it up; and uſe acidulated liquors often; his diet muſt be moiſt, light and laxative; he muſt abſtain from large quantities of aromatic ſubſtances, wine, &c. violent exerciſe of body, and all commotions of mind.

The cure is principally to be attempted in the firſt ſtage, or beginning of the ſecond. It ſeems probable, that the following method may be of ſome efficacy, eſpecially as it is confirmed by ſome few experiments. Immediately upon the ſigns of approaching madneſs, the caſe is to be treated as extremely inflammatory; wherefore a large quantity of blood muſt be taken away by a large orifice, even till the patient is faint; then directly inject nitrous clyſters, mixed with a little vinegar. Let theſe be repeated boldly, and more frequently than is conſiſtent with prudence in other caſes. After this the eyes are to be blindfolded, and the patient thrown into a pond, or cold water thrown upon him, till he be no longer afraid of it. Then let him be immediately forced to drink a large quantity of water; and toward the evening of the ſame day let ſleep be procured.

There is an account of remedies for this malady in the Philoſophical Tranſactions; one of which is the Lichen cinereus terreſtris, or aſh-colour'd ground liver-wort, which has been taken into the college Diſpenſatory, under the title of Pulvis Antilyſſus, and is the celebrated remedy publiſhed by Dr. Mead, with ſome variation in the proportion of the pepper. The directions, as made public, are, firſt to take away nine or ten ounces of blood; and then take of powdered aſh coloured ground liver-wort, four drachms; and of the powder of black pepper, two drachms: mix theſe together, and divide into four doſes; one of which is to be taken faſting for four days ſucceſſively, in half a pint of tepid cows milk. After taking theſe four doſes, the patient is to be put faſting every morning for a month, either into a cold bath, cold ſpring, or river, remaining therein with his head above water,

ter, not longer than half a minute, if the water be exceſſive cold; then let him bathe thrice a week for fifteen days.

Boerhaave tried what effect mercury would have upon animals under canine madneſs; and from ſeveral experiments, he found it proved ſucceſsful, by adminiſtring ſome grains of Turpeth mineral, made into boluſes. He alſo mentions the remedy which M. Deſault tried, with conſtant ſucceſs, in the Hydrophobia, which is a mercurial ointment, made of one-third part of mercury revived from cinnabar, one-third part of human fat, and as much of hog's-lard. One or two drachms of this ointment at a time ſhould be rubbed by intervals, or ſucceſſively, upon and about the wound. As a farther confirmation of the efficacy of mercury in canine madneſs, it is not improper to take notice of a medicine, brought Mr. Cobb, of Buſſalton, near Briſtol, from Tonquin, which is much celebrated in the Eaſt Indies, as efficacious in this diſtemper.

THE TONQUIN REMEDY.

Take of native and factitious cinnabar, of each twenty-four grains; muſk, ſixteen grains, powdered and well mixed together. This powder is to be taken all at once in a tea-cup of arrack, which is ſaid to ſecure the patient for thirty days; after which time the doſe is to be repeated in the ſame manner; it ſhould be done as ſoon as poſſible after the bite is received; but if the patient has any ſymptoms of the diſeaſe, the ſecond doſe muſt be repeated three hours after the firſt; and this is ſaid to be ſufficient for a cure.

Mead recommends the wound to be kept open, and enlarged, and to be dreſſed with ung. baſilic. nig. adding to it a ſmall quantity of red mercury præcipitate as a digeſtive; as it happens in moſt caſes, that the wound being ſmall, is healed before the patient ſeeks for help.

The ſureſt remedies in all ages againſt animal or vegetable poiſons, have been ſuch as provoke a great diſcharge by urine. Now as it is remarkable, that Dr. Mead's antidote is a powerful diuretic, and that the following poſſeſs the ſame remarkable qualities, I have introduced them upon rational grounds of their being efficacious.

Firſt, The aſhes of the river crab, prepared by burning the fiſh alive upon a copper-plate, after the riſing of the dog-ſtar, when the ſun is in Leo, and on the tenth day of the moon, with a fire made of the cuttings of twigs of the white briony, or tendrils of the white vine.

This as Galen avers (in his book de ſimpl. med. facult. l. ii. c. 1.) no body ever made uſe of without ſucceſs; and before him Dioſcorides (in his Treatiſe De Theriac. c. ii.) has aſſerted, that it is a medicine which might be relied on. This calcined powder was given in large quantities, viz. a ſpoonful or two every day for forty days together; either alone, or rather mixed with a ſmall portion of gentian root and frankincenſe.

The ſecond is the ſpongia cynorrhodi, vel roſæ ſylveſtris, the ſponge of the dog-roſe, which is ſo celebrated an antidote againſt this, and other animal poiſons, that P. Baccone, who in his Muſco di piante rare, obſ. 2. has written a whole diſcourſe upon its virtues, tells us, it is called, in Sicily, Sanatodos, or All-heal.

The third is the plant Alyſſum, or madwort, which had its name given it by the ancients, from its great efficacy againſt this madneſs. This is of two ſorts, one deſcribed by Dioſcorides, a ſpecies of the leucoium; the other by Galen, a manubrium *. To theſe may be added garlick, agrimony, and oxylapathum.

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* Vide Fab. Column. Phytobaſan, p. 27.

DR. JAMES'S METHOD OF CURE.

Rub into the part where the wound was received, a drachm or more of mercurial ointment, as ſoon as poſſible after the bite. That made by rubbing in a mortar two parts of hog's-lard, with one of crude quickſilver, will do; but equal parts of hog's-lard and crude quickſilver will be better, though it requires more trouble to unite them; for great care ſhould be taken to incorporate well the quickſilver with the lard. This ſhould be repeated every day for a week; but if it can be done twice a day, without ſalivation, it is the better. The evening of the ſame day let the patient take the following medicine.

Take of turpeth mineral, from three to eight grains, according to the ſtrength of the patient, and the degree of infection received, ſo far as can be judged by the bite; camphire, an equal quantity. Let this be made with any conſerve, as that of hips, into a bolus, or ball. This may poſſibly vomit, though the camphire is added to prevent it. The doſe ſhould be repeated the next evening but one; and again after forty-eight hours interval. This cannot be done without ſome hazard of a ſalivation, eſpecially in ſome conſtitutions. It muſt therefore be watched, and upon the firſt approach of any ſoreneſs of the mouth, or ſlavering, the farther uſe of the medicine ſhould be deferred till that ceaſes, and then be re-aſſumed.

About two or three days after the laſt doſe, if no accident happens as to ſalivation, the patient ſhould bathe in cold water over head every day, till the day before the next full or new moon. And that day let the doſe of Turpeth mineral be repeated for three times, as before; but I think the doſe may then be leſs, as two or three grains. And after the third doſe, let the patient again bathe as before, and let this method be repeated for three or four ſucceeding periods of the moon.

This is the preſervative method for the human ſpecies, but it will ſucceed equally with brutes, though it is impoſſible to ſpecify the exact doſes for them, as ſome are large, and others ſmall, and conſequently require larger or ſmaller doſes. In general, for a dog of a moderate ſize, ſix or ſeven grains of the Turpeth mineral are ſufficient.

But when any ſymptoms of the diſtemper begin to appear, ſomebody of ſkill ſhould attend; for then the cure depends upon ſaturating the body, as much as poſſible, with mercury, without raiſing a ſalivation precipitately, or ſo as to injure the patient. Therefore more mercury ſhould be rubbed in, and more frequent doſes of the Turpeth mineral ſhould be exhibited, as not a moment muſt be loſt; when this method is purſued, no heating medicines ſhould be given on any account. Nervous medicines, therefore, which in general excite heat, are to be carefully avoided. As yet no inſtance has come to my knowledge of a cure performed by any of the preparations of opium, nor by muſk, without mercury.

The Tonquin remedy, is in conſiderable reputation, and I have reaſon to believe, not without deſerving it, in ſome meaſure. The uſe of it, which I would recommend is (after the preſervative method has been duly purſued) to take twenty-five grains of the native cinnabar, twenty-five grains of factitious cinnabar, and fourteen grains of the beſt muſk, in a glaſs of arrack, the night before ſeveral of the ſucceeding great periods of the moon.

DR. TISSOT'S METHOD OF CURING THE HYDROPHOBIA.

1ſt, The patient muſt be bled to a conſiderable quantity; and this may be repeated twice, thrice, or even a fourth time, if circumſtances require it.

2dly, The patient ſhould be put, if poſſible, into a warm bath; and this ſhould be uſed twice a day.

3dly, He ſhould every day receive two, or even three, emollient clyſters.

4thly, The wound, and the parts adjoining to it, ſhould be rubbed with the mercurial ointment twice a day.

5thly, The whole limb which contains the wound ſhould be rubbed with oil, and be wrapped up in an oily flannel.

6thly, Every three hours, a doſe of Cob's powder ſhould be taken in a cup of the infuſion of lime-tree, and elder flowers. This powder is made, by rubbing together in a mortar, to a very fine powder, of native and factitious cinnabar, each twenty-four grains; of muſk, ſixteen grains.

7thly, The following bolus is to be given every night, and to be repeated in the morning, if the patient is not eaſy, waſhing it down with the infuſion mentioned above: take one drachm of Virginia ſnake-root in powder of camphire and aſſafœtida, ten grains each: of opium, one grain; and with a ſufficient quantity of conſerve, or rob of elder, make a bolus.

8thly, If there be a great nauſea at the ſtomach, with a bitterneſs in the mouth, thirty-five or forty grains of ipecacuanha, in powder, may be taken for a vomit.

9thly, The patient's food, if he takes any, muſt be light; as panada, ſoups made of mealy vegetables, &c.

10thly, If the patient ſhould long continue weak, and ſubject to terrors, he may take half a drachm of the Peruvian bark thrice a day.

The author thinks it his duty here to ſet a mark of infamy upon that operation, which is called Worming a dog; and the rather, becauſe, the notion many people have, that no dog can go mad after it; and of others who firmly believe, that a dog thus treated cannot bite, tho' he ſhould he afterwards mad, may have very untoward conſequences,

ſequences, by lulling thoſe of this opinion into a fatal ſecurity, whilſt they are converſant with the domeſtic animals that have ſuffered this ridiculous cruelty.

Almoſt every town or village in England has ſome cobler, farrier or huntſman, who boaſts a dexterity in taking a worm from under the tongue of a puppy. They elevate the tongue, and with an awl or a penknife, or ſome pointed inſtrument, make a puncture under it, and draw out a very ſlender filament, which I take to be a nerve; and this contracting when recently taken away, the ideots fancy it ſtirs, and believe it a worm, to which it bears no manner of reſemblance.

Be that as it may, I am certain from experience, that dogs thus treated run mad equally with thoſe who have never ſuffered this abſurd operation. There is no worm in the part, and conſequently none can be taken out. All that this can do, is to prevent puppies from gnawing every thing they meet with; and for no other reaſon, than becauſe it makes their mouths ſore, and gives them pain when they take any thing hard in their mouths; and this breaks them of the habit.

OF SERPENTS.

SERPENTS are defined to be creatures breathing by means of lungs, having only one ventricle in the heart, having no feet, and having a long body covered with ſcales; to which we may add, that in cold ſeaſons they can bear hunger a long time. The greater part of the ſerpent claſs are poiſonous, and dangerous in their bite, leaving a miſchievous liquor in the wound made by their teeth, which, by this means, mixing immediately with the blood, is of fatal conſequence; though the whole creature may be eaten with ſafety, or even the poiſonous liquor, which does this miſchief in the wound, may be taſted without hurt. Notwithſtanding that ſerpents reſpire by means of lungs, they do not take in and diſcharge their breath by ſuch ſhort intervals as other animals, but what they have once inſpired will ſerve them a long time; for as they are of a cold nature, and naturally their neceſſary vital warmth very ſmall, they do not require ſuch an eternally renewed ſupply of that pabulum of vital heat, as thoſe which have more of it; and as with us they lie half the year torpid, and half dead, their vital warmth at that time, like fire ſmothered under aſhes, barely exiſts, and needs perhaps no more air, that what the creature took in at one inſpiration, before its laying itſelf down for the ſeaſon, which ſerves it till the life-renewing ſpring returns. Serpents, according to Mr. Ray, may be divided into the poiſonous and the harmleſs;

the firſt having long dentes exerti, with a poiſonous liquor contained at their bottom, which on biting they diſcharge into the wound; the others wanting theſe teeth and this poiſon. They may alſo be divided in regard to their generation, into the oviparous and viviparous; but this is a leſs firmly founded diſtinction than may be ſuppoſed, ſince all ſerpents are truly and properly produced from eggs, and the only difference is, that ſome depoſit their eggs in dunghills, and the like places, to be hatched by accidental heat; while others retain thoſe eggs to be hatched in their own bodies, and ſo bring forth living young ones, Of the firſt kind is the common ſnake, of the latter the viper. This ſeries of animals comprehends ſeveral diſtinct genera; as the Amphiſbæna, Anguis, Coluber, Cenchris, and Crotalophorus.

THE

RATTLE SNAKE.

THE Rattle Snake is a genus of ſerpents, having ſcuta that cover the whole under ſurface of the body and tail, and having the extremity of the body terminated by a kind of rattle, formed of a ſeries of urceolated articulations, which are moveable, and make a noiſe.

Of this ſerpent there are two ſpecies, the greater one with the ſcuta of the abdomen, in number a hundred and ſeventy-two; of the tail, twenty-one: and the leſſer rattle ſnake, having of the abdomen a hundred and ſixty-five; of the tail twenty-eight ſcuta; the larger kind is a very terrible, and at its full growth a very large ſerpent, growing to eight feet in length, with a proportionable thickneſs; the head is large, broad, depreſſed, and of a pale brown; the iris of the eye is red, the back is of a brown colour,

lour, with an admixture of a ruddy yellow, and variegated with a great many irregular tranſverſe liſts of a deep black; the belly is of a paliſh blue; the rattle is of a firm, and, as it were, of a horny ſubſtance, and brown colour, compoſed of a number of cells, which are articulated one within another, which articulations being very looſe, the included points ſtrike againſt the inner ſurface of the rings they are admitted into, and make that rattling noiſe, when the ſerpent vibrates or ſhakes its tail. This ſerpent is frequent in the woods of America; the bite is fatal, but it is eaſy to avoid it, the creature being ſluggiſh, moving ſlowly, never attacking a man, unleſs provoked, and giving notice before it bites, by ſhaking its rattle.

The leſſer ſpecies of this ſerpent grows to about ſeven feet in length, and in moſt particulars is like the former, and its bite is equally miſchievous.

A very remarkable Account of a MAN bit by a RATTLE SNAKE in AMERICA, from the Philoſophical Tranſactions, No. 479.

Going up a ſteep hill that was ſtony, I being ready to fall, ſaved myſelf by my hands, and got ſafe very near the top; where either my foot ſlipt, or the ſtone under it gave way, and brought me down upon my knees. I laid my hand on a broad ſtone to ſtay myſelf; and, I ſuppoſe, the ſnake lay on the oppoſite ſide, and might be offended by ſome motion of the ſtone, ſo bit my hand in an inſtant, without any warning or ſight; then ſlid under the ſtones, and ſounded his rattles. I felt a ſort of chillneſs when I heard the ſound, becauſe I had a conſtant thought, that if ever I was bit my life was at an end. Immediately I ran home, ſucking the wound as I went, and ſpitting out the poiſon. This kept it eaſy, but my tongue and lips became ſtiff and numb, as if they had been frozen.

The firſt thing applied was a fowl, which being ript open, was put on my hand alive, like a gauntlet, and then tied faſt. This drew out ſome of the poiſon; for immediately the bird ſwell'd, grew black, and ſtunk. I kept my elbow bent, and my fingers turned upwards, to keep the poiſon from my arm.

During this time another perſon had got ſome *turmerick*; this was bruiſed well, tops and roots, ſo made into a plaiſter, and bound round my arm, to keep the poiſon in the hand: night now came on, or elſe, I believe, it had never gone further than the hand; for this kept the arm ſecure till midnight, or after: nor all this while had I much pain: my hand grew cold and numb, but did not ſwell very much; but now it puffed up on a ſudden, and grew raging; ſo I ſlit my fingers with a razor, and this gave me ſome eaſe: I alſo ſlit my hand on the back, and cupped it, and drew out a quart or more of ugly, poiſonous, ſlimy ſtuff. But my arm ſwelled for all we could do: then I got it tied ſo faſt, that the communication with the body might be ſtopped, that it ſeemed almoſt void of feeling; yet would it work, jump, writhe and twiſt like a ſnake in the ſkin, and change colours, and be ſpotted; and then the ſpots would move to and fro upon the arm, which grew painful in the bone. Thus was it kept tied two days, and all things applied that could be got or thought on. At laſt the

Aſhes of WHITE ASH BARK and VINEGAR,

made into a plaiſter, and laid to the bite, drew out the poiſon apace. My tongue and lips ſwelled that night, but were not very painful, occaſioned only, I ſuppoſe, by ſucking the wound. The ſwelling of my arm being more than half down, we then untied it; but, in two hours, all my right ſide was turned black, yet ſwelled but little; nor was there any pain went along with that change of colour: I bled at the mouth ſoon after, and ſo continued, with a fever, four days. The pain raged ſtill in the arm, and the fever grew more violent; and, by turns, I was delirious for an hour; this happened three or four times, but at the end of nine days the fever abated, and I began to mend; but my hand and arm were ſpotted like a ſnake, and continued ſo all ſummer. About September or October my arm ſwelled, gathered, and burſt; ſo away went the poiſon, ſpots and all, heaven be thanked, for ridding me of ſuch a curſed adverſary. But the moſt ſurpriſing circumſtance was, to find my ſleeping hours diſturbed with the operation of that horrid poiſon, being conſtantly tormented with frightful dreams.

The bites of venomous ſnakes are frequent in our warmer American colonies, and on account of the great variety of ſnakes, our ignorance of the effects of their poiſon, which are extremely various, it is impoſſible to aſcribe ſucceſs to any one particular remedy with certainty. For ſometimes

times a fatal diſſolution of the fluids enſues, but moſt frequently a painful tumefaction and inflammation of the wounded part, with a fever, &c. is the conſequence. In ſome inſtances the tumefaction ſubſides, without any apparent diſcharge; in others it is converted into an abſceſs, which terminates in a copious flux of ichor or pus. A cataplaſm from the pulp of lemons, or limes with ſea ſalt, applied to the wounded part, is the general remedy for venomous bites in the ſouthern colonies; and I have often uſed it with ſucceſs, after ſcarifying the wound: at other times I have ſucceſsfully ſubſtituted a cataplaſm from the meal of the ſeeds of the vegetable muſk, or wild ocro plant, with olive oil; but to theſe I have uſually adjoined oily embrocations of the adjacent parts, with the internal uſe of the treacle of Andromachus, decoctions of Seneca, and Virginia ſnake-root, or an emulſion of the ſeeds of the muſk plant; theſe have hitherto been ſucceſsful, though there are undoubtedly poiſons, againſt which no art can avail, ſuch as that of the ſmall Labarra, a ſnake common in Guiana.

For the Negroe Cæſar's cure for the bite of the Rattle-ſnake, ſee page 220.

THE ASP.

AETIUS obſerves, that there are three kind of Aſps, the terreſtrial, the chelidoniæ, which are found on the banks of the Nile, and the Plyades: the terreſtrial are ſometimes five cubits in length; but the plyades are longeſt, and of an aſh-colour, mixed with green and gold. The terreſtrial are generally of an aſh-colour, but ſometimes greeniſh.

The bite of an aſp is like the prick of a needle, which is double from a male, from a female quadruple. Nothing diſtils from the wound, unleſs the animal is very angry; it is attended with a ſtupor, paleneſs, coldneſs of the forehead, continual yawning, twinkling of the eyes, inclination of the neck, laſſitude of the body, and a profound ſleep, with convulſions.

The bite of the chelidonia is immediate death; that of the terreſtrial aſp kills in 3 hours; that of the plyades produces dimneſs of ſight, pain at the heart, ſwelling of the face, deafneſs, and at laſt death. The ſymptoms from the bite of this kind of aſps come on more ſlow.

ANTIDOTE,

Drinking plentifully of the ſharpeſt vinegar is ſaid to be a cure; and Celſus gives an inſtance of a boy cured by drinking of vinegar, when there was nothing elſe at hand.

THE

VIPER.

THE Viper has always been ſo remarkable for its venom, that writers of the moſt remote antiquity have made it an emblem of what is hurtful and deſtructive.

The venomous juice is yellowiſh, but ſo inconſiderable in the quantity, that it is no more than one drop that does the execution. Mead, on examining it, ſays, at firſt ſight I could diſcover nothing but a parcel of ſmall ſalts nimbly floating in the liquor; but in a very ſhort time the appearance was changed, and theſe ſaline particles were now ſhot out, as it were, into cryſtals of an incredible tenuity and ſharpneſs, with ſomething like knots here and there, from which they ſeemed to proceed, ſo that the whole texture in a manner repreſented a ſpider's web, though infinitely finer, and more minute; and yet withal ſo rigid were theſe pellucid ſpicula, or darts, that they remained unaltered upon a glaſs for ſeveral months.

The ſymptoms which follow the bite of a viper, are a ſharp pricking pain in the wounded part; a tumour, which is firſt red, and afterwards livid, ſenſibly extending itſelf to the neighbouring parts; a palpitation of the heart; a ſtupefaction of the ſenſes; an anxiety of the præcordia; great ſickneſs at the ſtomach, with bilious vomiting; a dulneſs of ſight; ſometimes pains about the navel, or the region of the liver; difficult breathing, hiccoughs, tremblings, convulſions, cold ſweats, coldneſs of the extremities; after which death cloſes the ſcene, unleſs prevented by timely remedies, or the vigour of the conſtitution; which Hoffman thinks is generally the caſe in theſe northern climates. If the patient ſurvives, a tumor with inflammation continues for ſome time. Sometimes a ſanies flows from the wound, and puſtules appear, like the herpes exedens: and the ſkin becomes yellow, as if the patient had the jaundice.

Hoffman obſerves, that externally in all venomous bites, it will be proper to apply ſuch things as relax and mollify the ſtructure of the parts that open the pores, in order to procure an exit for the virulent matter. Thus the ancients applied the parts of animals juſt killed to the wound; and Celſus adviſes to cut a pullet in two, and apply it hot thereto; or a kid, or a lamb, which likewiſe muſt be laid on hot. Foreſtus likewiſe recommends the ſame, or the breech of a living pullet.

Linderus adviſes to inſtil a drop of ſpirit of ſulphur, or vitriol, into the wound. Internally, Celſus adviſes pepper, with a large draught of generous wine; after which, he judges ſweating in a warm bath to be proper. Boyle obſerves, that a hot iron held over the wounded part, immediately after the bite, ſo checks and weakens the venom, that the patient will have nothing to complain

plain of but a pain in the part of ſhort continuance. But above all, Mead, from many experiments, recommends the fat of vipers, which being rubbed into the wounded part, renders all other remedies uſeleſs; and if that is not at hand, it appears from ſome late trials, that common ſallad oil, rubbed warm into the part, will do as well. The Virginian Indians cure the bite of a Viper, or of a Rattle-ſnake, by ſucking the wound (firſt bathing the wound, and rinſing the mouth with warm oil) giving immediately a large quantity of a decoction of the ſeneca rattle ſnake-root (which vomits plentifully) and laying to the part the ſame root chewed.

The viper-catchers when bitten apply preſently ſome axungia viperina (fat of the viper) which proves effectual; common ſallad oil rubbed into the part, as above remarked, has alſo been found a remedy of equal virtue.

OF THE POISONOUS JUICES EXTRACTED FROM THE VIPER; THE INDIAN LIZARD, CALLED GECCO; AND THAT DEADLY KIND OF SERPENT AT THE CAPE OF GOOD HOPE, CALLED BY THE PORTUGUESE, COBRAS DE CAPELLO.

Pliny, in his Nat. Hiſt. lib. xi. c. 53, aſſures us, that the Scythians poiſoned their arrows with the ſanies of vipers mixed with human blood. The way of doing it Ariſtotle, in his De mirabilibus, has at large related: and the Tartars are ſaid to uſe the trick to this day. After the ſame manner the Indians make uſe of the venom of the lizard, called Gecco. This creature they hang up by the tail, and by whipping exaſperate it, till it diſcharges its virus, in which they dip their darts. Bontius, in his Hiſtory of India, book v. c. 5. ſays, a very ſlight wound with theſe weapons is ſpeedy death. Peter Kolben, in his Deſcription of the Cape of Good Hope, printed in 1719, pag. 532, informs us, that the way by which the inhabitants there, called Hottentots, kill large wild beaſts, ſuch as lions, tygers, elephants, &c. is this: they take the bladders of poiſon with their liquor, out of the gums of that deadly kind of ſerpents, called by the Portugueſe Cobras de Capello; theſe they dry in the ſun, and grind them to powder betwixt two ſtones: this powder they make into a paſte with the ſpittle or ſlabber of the ſame creature; which paſte they rub upon the points of their darts, and lay them by to dry for their uſe.

Other poiſonous animals are the Spider, called by Mr. Boyle and Piſo the Nhamdu; in catching it great heed is to be taken, leſt its poiſon fall into the eye, this cauſing a total loſs of the ſight.

The SCORPION, and SCOLOPENDRIA, or CENTIPES, the bite whereof, as Bontius ſays in his Hiſtory of India; is ſo painful, that it makes the patient almoſt mad.

The caſe is much the ſame with the SCORPION, whoſe virus in different countries is more or leſs dangerous, according as it is exalted by various degrees of heat: thus in Africa particularly, its effects are ſo dreadful, that as John Leo, in his Hiſtory of Africa, lib. vi. tells us, the town of Peſcara there is in a manner left deſolate by the inhabitants in the ſummer time, by reaſon of the great abundance of theſe creatures; certain death following their ſting.

As to the TARANTULA, or ſpider of Apulia, whether the ſting be poiſonous or not, I cannot determine, as many aſſert that it is ſo, and others deny the ſame; the antidote for its poiſon is ſaid to be muſic.

OF THE

STING OF A BEE.

AS the ſtructure and contrivance of moſt ſtings are nearly alike, by deſcribing one, the reſt will be underſtood; I ſhall therefore give a brief account of the ſting of a bee, as diſcovered by the microſcope.

The ſting of a bee is a horny ſheath or ſcabbard, that includes two bearded darts; this ſheath ends in a ſharp point, near the extremity whereof a ſlit opens, through which, at the time of ſtinging, two bearded darts are protruded beyond the end of the ſheath; one whereof, being a little longer than the other, fixes its beard firſt; but the other inſtantly following, they penetrate alternately deeper and deeper, taking hold of the fleſh with their hooks, till the whole ſting becomes buried in the wound; and then a venomous juice is injected, thro the ſame ſheath, from a little bag at the root of the ſting, which occaſions an acute pain, and a ſwelling of the part, continuing ſometimes ſeveral days. This is beſt prevented by enlarging the wound immediately, to procure a free diſcharge.

To view the ſting of a bee by the microſcope, cut off the end of its tail, and then, touching it with a pin or needle, it will thruſt out the ſting and darts, which may be ſnipped off with a pair of ſciſſars, and kept for obſervation. Alſo, if you catch a bee in a leather glove, its ſting will be left therein, being unable to diſengage the hooks from leather: and when it is quite dead, which it will not be till after ſeveral hours, you may, by care and gentleneſs, extract the ſting entire with its hooks. By ſqueezing the tail, pulling out the ſting, and preſſing it at the bottom, you may likewiſe force up the darts; but without ſome practice this will be rather difficult. The bag, containing the poiſonous juice, may eaſily be found at the bottom of the ſting, and examined, being commonly pulled out with it: and by letting the bee ſtrike its ſtring upon ſome hard body, enough of the ſaid juice may be obtained, to put upon a ſlip of glaſs, in order to view the ſalts, floating therein at firſt, and afterwards ſhooting into cryſtals.

O F

W A S P S.

MR. Durham ſays, he counted, in the ſting of one of our waſps, eight beards on the ſide of each dart, ſomewhat like the beards of fiſh-hooks; and I have obſerved the ſame number in that of a bee. When theſe beards are ſtruck deep in the fleſh, if the wounded perſon ſtarts before the bee can diſengage them, ſhe leaves her ſting behind, ſticking in the wound; but if he has patience to ſtand quiet till ſhe brings the hooks cloſe down to the ſide of the darts, ſhe withdraws her weapon, and the wound becomes much leſs painful. A waſp is not ſo liable as a bee to leave its ſting behind, the beards of it being rather ſhorter, and the animal ſtronger and more nimble.

Heiſter ſays, the ſtings of waſps and bees may be cured with vinegar alone, or mixed with Venice treacle, or Armenian bole. Some commend the rubbing of the part with the pulp of an apple.

OF THE

POISON OF A TOAD.

THE Toad, ſays Allen, is full of venom, and the very centre and repoſitory of terreſtrial poiſons. If they have no teeth, yet their gums are hard and rough, and by a powerful adheſion, ſo operate upon the part as to inſtil their venom therein. The virulence of this animal ſeems to conſiſt in its rage, or excrements, particularly in a ſharp cauſtic urine, impregnated with a volatile ſalt; for when they are dead, they are ſaid to be not at all venomous. They diſcharge their venom on herbs, by piſſing, ſpitting, and vomiting, eſpecially on ſtrawberries, which they are ſaid to be very greedy of. This is not only pernicious by getting into the body, but by being ſprinkled on the ſkin, unleſs waſhed off immediately with urine and ſalt.

When a perſon is infected, his ſkin turns yellow, his body ſwells univerſally, his lips and tongue grow black, and a ſtammering ſupervenes; he is ſeized with an aſthmatic ſhortneſs of breath, vomiting, cold ſweats, convulſions, fainting, and, at length, death enſues.

If the patient has ſwallowed the poiſon, he muſt take a vomit and a clyſter, as alſo warm and attenuating alexiterials, as theriaca and mithridate in generous wine, bathing in ſalt water, and much exerciſe.

In all venomous bites and ſtings, it will be proper to relax the ſkin by emollient fomentations, and cataplaſms of bread, milk, and oil; and ſometimes with the theriaca mixed. Milk is counted an univerſal remedy againſt all poiſons that kill by inflammation; more eſpecially with the addition of oil.

CANTHARIDES.

CANTHARIDES are inſects of the flying kind, and a ſpecies of ſhining beetle, of a golden azure, or greeniſh colour, and of a fetid ſmell. Theſe flies are found on aſh-trees, roſes, elder-trees, walnut-trees, &c. and among the corn, which they corrode and deſtroy. Taken inwardly, they cauſe a furor uterinus, a priapiſm, diſeaſes in the tongue, in the ſtomach, and in the kidnies, the bladder is inflamed and ulcerated, the perſon can ſcarcely make water, without infinite pain, and a diſcharge of ſemen and blood. The caterpillars of the fir-tree, called Bupreſtes, have the ſame effects.

Powdered Cantharides, applied to the epidermis, or ſcarf-ſkin, not only exulcerate it, but alſo frequently excite a heat of urine, ſtranguries, thirſt, a fever, and ſometimes a piſſing of blood, and a fetid cadaverous breath. When uſed internally, they alſo excite all the above mentioned ſymptoms, and are in a ſingular manner prejudicial to the urinary bladder.

A man having cantharides applied to his knees voided more than five pounds of blood by way of urine; they produce alſo an inſatiable deſire of venery, tumor in the ſcrotum, and after the ſeminal matter is exhauſted, blood is diſcharged in its place, and if not timely prevented, death follows.

Accordingly, Lanzonius Parè informs us, that a Courtezan treated a young man with a ſplendid ſupper, dreſſed with ſauces, in which ſome powder of cantharides had been ſprinkled. But next day her unfortunate gueſt, diſcharging blood from his anus, and his perpetually erected penis, died, in ſpite of all the medicines that could be exhibited for his relief.

GENERAL SYMPTOMS.

They produce an inſatiable deſire of venery, perpetual erections, a furor uterinus, convulſions of the penis, involuntary diſcharges of the ſemen and bloody urine; the bladder and urethra are exulcerated, then the liver is gradually inflamed, the inteſtines corroded, and violent pains are excited in the hypogaſtrium; and theſe pains are ſucceeded by loſs of reaſon, and death, unleſs the cantharides be forthwith evacuated, or the violence of their action broken.

A man having cantharides exhibited to him, was preſently ſeized with the following ſymptoms: every part, from his mouth to his bladder, to him ſeemed to be corroded; his breath ſmelled like the roſin of the cedar, or ſome ſuch ſubſtance; the præcordia on the right ſide were inflamed, he diſcharged his urine with difficulty, and a mixture of blood was now and then evacuated along with it. By ſtool he evacuated juſt ſuch fæsces as dyſenteric patients; he loathed his food, became ſubject to fainting fits, was ſeized with ſo violent a vertigo, that he dropped down, and at laſt loſt the uſe of his reaſon in ſome meaſure.

ANTIDOTES

This patient had oil of ſweet almonds, newly expreſſed, and mixed with butter, exhibited with an intention to vomit him: ſoon after a decoction of mallows, linſeed, fenugreek, and marſh-mallow-roots, was injected by way of clyſter; and an emulſion of the four cold ſeeds was exhibited in milk; ſoon after water and honey, and fat broth, prepared with fowls, when the patient became better.

Acids are uſeful drank in proper quantities, and alſo applied externally: the beſt of theſe for external uſe is warm wine vinegar; and in the caſe of a priapiſm, the lees of generous wine. For internal uſe: ſimple oxymel and large quantities of new milk; theriaca with ſorrel water to procure ſleep; cordial ſyrups, and emulſions.

REMARKS

ON THE

GENERAL EFFECTS OF POISONS.

A SPITTING of blood comes in a very ſmall quantity from the eroded veſſels of the aſpera arteria, and is brought up with coughing, commonly attended with itching, and a ſalt taſte. This proceeds from a corroding cauſtic, contained in the ſtomach.

The ſenſe of heat in the cardialgia is extreme. Its ſeat is the upper orifice of the ſtomach; ſometimes the cauſe of it lies in the ſtomach itſelf, being a ſharp, cauſtic matter, as in the caſe of poiſons, and violent emetics: in the bilious cholic and dyſentery it proceeds from a very ſharp cauſtic bile.

The pain muſt be appeaſed by demulcents, oily temperant medicines, aſſes milk, or a ſaturated infuſion of chamomile flowers with cream, as alſo by abſorbent powders.

In diſeaſes of the head, ſuch as the vertigo, phrenzy, madneſs, melancholy, or epilepſy, the urine is always thin and light. It is likewiſe the ſame in the more grievious affections of the nerves, from poiſon, or worms. Thus lighted charcoal, in a cloſe place, fills the air with ſulphureous particles, which ſometimes kill the ſtrongeſt perſons.

ON THE PULSE.

Poiſons render the pulſe ſmall, contracted, and hard.

ON THE NERVOUS PARTS.

Cauſtic poiſonous matter conveyed to the nervous fibrils of the wounded ſkin, by the bite of a viper, ſcorpion, mad dog, or by an inſtrument moiſtened with the juice of white hellebore, oil of tobacco, or an arſenical liniment, will throw the nervous ſyſtem into commotions and ſpaſtic strictures. Hence a fever, ſyncope, cold ſweat, paleneſs, nauſea, vomiting, yellowneſs of the ſkin, convulſions, alienation of the mind, obſtinate coſtiveneſs, ſuppreſſion of urine, high anxiety, and difficulty of breathing.

And here ſpecifics or antidotes are neceſſary, if poſſible, to ſubdue the active particles of the poiſon. The ſting of a Waſp, in a membranous part, will ſometimes produce terrible ſymptoms.

GENERAL SYMPTOMS.

The ſtomach has the moſt intimate ſympathy with all the reſt of the parts; for let the nerves be hurt any where, the ſtomach always ſuffers. Even a ſtrong blow on the pit of the ſtomach has been fatal. Nothing makes this more evident, than the taking of arſenic, or any corroſive preparations of mercury, or antimony; cicuta aquatica;

cantharides, or their tincture, and fungi of various kinds, as alſo draſtic purges, which alone cauſe the ſtrongeſt ſpaſtic contractions of the whole nervous ſyſtem. Hence a cardialgia, reaching to vomit, hiccough, anxiety of the præcordia, difficulty of breathing, conſtriction of the diaphragm, dryneſs of the tongue and fauces, unquenchable thirſt, coſtiveneſs, retention of wind, a griping looſeneſs, a perpetual ſtimulus to urine, coldneſs of the extremities, cold ſweats, an hippocratic countenance, a trembling of the limbs, an intermitting pulſe, a delirium, fainting, convulſions, and epilepſy; which are the general ſymptoms of poiſon, and ariſe from the eroſion of the coats of the ſtomach.

A fever ſometimes attends thoſe that are poiſoned, owing to a poiſonous, ſubtle, cauſtic matter, either bred within the body, or received by infection; a ſtoppage of perſpiration; a ſuppreſſion of critical ſweats; eruptions driven back; an abundance of purulent ulcerous matter adhering to various parts. In this caſe all acids are highly praiſed, ſuch as Seville oranges, lemons, vinegar, &c. which reſiſt poiſon and putrefaction, and prevent the diſſolution of the blood.

OF THE INFLAMMATION OF THE STOMACH.

An inflammation of the ſtomach, which ariſes from draſtic purges, ſharp emetics, or cauſtic poiſons, kills quickly, without ſpeedy aſſiſtance.

When occaſioned by a cauſtic, ſeptic, arſenical poiſon, or by a ſtrong emetic or cathartic, or by metallic remedies badly prepared, oily fat things are proper, as new milk, cream, oil of ſweet almonds, or olive oil, with honey, and honey of roſes, which are cleanſing; and decoctions of comfrey-root, or new milk, which are healing, taken often and plentifully.

OF AN INFLAMMATION OF THE FAUCES.

Some cauſtic poiſons affect the throat more than other parts, cauſe an inflammation of the fauces, with a burning pain, tumour and redneſs, and a difficulty in breathing and ſwallowing. Thus white Hellebore affects the fauces, and brings on a ſtrangulation. The ſame enſues from the ſolanum furioſum, and the bite of a mad dog. The fumes of arſenicals and mercurials, as alſo the vapours of mineral ſpirits, have the ſame effects. In the Philoſophical Tranſactions, the jelly of black currants, ſwallowed down leiſurely in ſmall quantities, is aſſerted to be a ſpecific for a quinſey [or inflammation of the fauces] and in the winter, a decoction of the leaves or bark in milk, when the jelly cannot be had, uſed as a gargle, is ſaid to cure all inflammatory diſtempers of the throat.

OF VOMITING.

Vomiting is cauſed by poiſons, as the inflammation of the inteſtines, &c. In this caſe, nothing is better at the beginning, than drinking large quantities of milk and fat oily things, to ſheath the acrimony of the poiſon, and bring them up by vomiting.

SYMPTOMS ATTENDING MINERAL POISONS.

Anus, a mortification of the,	Arſenic.
Anxiety, inexpreſſibly cruel,	ditto
Dejection, with ſighing great,	ditto.
Convulſive cholic, or dry belly-ach,	Lead.
Coſtiveneſs, obſtinate, with cholicky pains,	Fumes of Lead.
Dryneſs and roughneſs of the tongue, fauces and gullet,	Arſenic.
Heart, palpitation of,	ditto.
Hiccough, painful,	ditto.
Inquietude, extreme and cholic,	Fumes of Lead.
Inteſtines cruelly tormented, convulſed, and their coats mortified,	Arſenic.
——Pain intolerable in,	Fumes of Lead.
Joints, contraction of,	ditto.
Nauſea, with reaching and inclination to vomit,	ditto.
Navel drawn inwards,	ditto.
Pain, in the inteſtines, intolerable,	ditto.
Pain in the inteſtines, cruel, and convulſions, therein,	Arſenic.
Palpitation of the heart,	ditto.
Sighing, great,	ditto.
Stomach, heat and pain in the, moſt violent,	ditto.
Thirſt, unquenchable,	ditto.
Ulcers of the fauces, and their ſalival glands,	Mercury.
Vomiting, enormous, with moſt cruel gripings,	Glaſs of Antimony.
Ditto.	Verdigreaſe, or the poiſon of copper.
Voice, a faintneſs, or loſs of,	Arſenic.

SYMPTOMS ATTENDING VEGETABLE POISONS.

Abdomen, ſwelling of the, —	Hemlock, &c.
Body, ſtrange ſhaking, writhing and diſtorting of the,	ditto.
Epilepſy, ——	Eating poiſonous vegetables.
Giddineſs of the head, ——	Poiſon by ditto.
Hiccough, ſupervenes to a painful,	Hemlock.
Madneſs, ſtupidity, &c. ——	By Datura, berries of deadly night-ſhade, and roots of cicuta terreſtris.
Mouth, a flux of green froth from the, after death, ——	ditto.
Reaching to vomit, fruitleſs,	Hemlock, &c.
Senſes, abolition or ſuſpenſion of,	ditto.
Sleepineſs, continual, with a torpor,	Opium.
Spaſms, univerſal, ——	Hemlock, &c.
Stomach, pain in, with a ſenſe of pricking, and heat, turning to a mortification,	ditto.
Stomach, a ſwelling, like one's fiſt at the pit of, ——	ditto.
Stupidity, —— ——	ditto.
Vertigo, —— ——	ditto.

SYMPTOMS ATTENDING AMERICAN AND INDIAN POISONS, &c.

Anxiety.
Appetite, want of, or weak,
Breathing, difficulty of,
Breaſt, a pain of,
Burning, and violent pains of the viſcera, above and below the navel,
Body, pains all over the,
Blood, an evacuation of,
Contractions of the Nerves,
Cardialgia, and reaching to vomit,
Coldneſs of the extremities,
Cold ſweats,
Countenance, an hippocratic,
Convulſions,
Coats of the ſtomach ulcerated,
Coſtiveneſs, obſtinate,
Death, immediate, or protracted for a longer time, according to the doſe,
Dryneſs of the tongue, &c.
Delirium,
Eroſion of the coats of the ſtomach,
Fever, an inward,
Face pale, yellow, and ſwelled,
Feebleneſs, univerſal,
Fauces, dryneſs of,
Fainting,
Inflammation of the throat, fauces, and gullet,
Inflammation of the ſtomach,
Hair falling off of the.

Hiccup,

Hiccough,
Load at the pit of the ſtomach,
Limbs, weakneſs of the,
Limbs, trembling of the,
Mind, alienation of the,
Navel, great pains above and below it.
Nauſea, or inclination to vomit,
Pain violent in the breaſt, above and below the navel, in the viſcera, and over the whole body,
Pulſe, intermitting,
Paleneſs,
Reſtleſſneſs at night,
Skin, peeling of the,
Slimy ſtools,
Sweats, profuſe,
Spittle, a flux of, and a copperiſh taſte in the mouth,
Throat inflamed,
Urine, difficulty in making,
Vomiting and inclination thereto,
Weakneſs in the limbs.

SYMPTOMS ATTENDING ANIMAL POISONS.

Bite the by-ſtanders, a great inclination to,	Hydrophobia, or dread of water.
Body, a laſſitude or wearineſs of,	Bite of an aſp.
Body, laſſitude, heavineſs and reſtleſſneſs of,	Bite of a mad dog.
Breathing, ſhort and aſthmatic,	Bite of a toad.
Coldneſs of the extremities,	Bite of a viper.
Coldneſs of the forehead,	Bite of an aſp.
Convulſions, violent,	Poiſon of a toad.
Delirium, raging,	Bite of a mad dog.
Dread of water,	Bite of a mad dog.
Eyes, twinkling,	Bite of an aſp.
Fainting,	Poiſon of a toad.
Fainting, remarkable,	Bite of a viper.
Fever, an acute, continual,	Bite of a mad dog.
Jaundice, univerſal,	Bite of a viper.
Heat increaſed,	ditto.
Heart, palpitation of,	ditto.
Hiccough, a painful,	ditto.
Horror, at the ſight of liquids, bright, or pellucid things,	Bite of a mad dog.
Hydrophobia, or dread of water,	ditto.
Lips, black and ſwelled,	Poiſon of a toad.
Liquids, a trembling, ſhaking, and abhorrence at the ſight of,	Bite of a mad dog.
Liver, pain ſometimes fixed about the region of,	Bite of a viper.
Muſic and dancing, delight in, with many antic geſtures,	Bite of a tarantula.
Navel, pains ſharp and pricking ſometimes about the,	Bite of a viper.
Pain in the region of the liver, fixed ſometimes,	ditto.
Pain about the navel, ſharp and pricking,	ditto.

Pain in the part bitten, and afterwards aſcending towards the throat, — ——	Bite of a mad dog.
Pain in the part bitten, ſharp and twitching, ——	Bite of a viper.
Palpitation of the heart, —	ditto.
Præcordia, anxiety of the,	ditto.
Præcordia, a prodigious ſtraitneſs of, —— —	Bite of a mad dog.
Priapiſm, — ——	ditto.
Pulſe and breathing intermitting,	ditto,
Pulſe, intermitting ſometimes; quick, weak, ——	Bite of a viper.
Sadneſs, ſighing, and love of ſolitude, —— —	Precedes the hydrophobia.
Senſes, a ſtupor, or ſtupefaction of,	Bite of a viper.
Shaking and trembling at the ſight of water, or any thing bright and pellucid, ——	Bite of a mad dog.
Skin, yellow, —	Poiſon of a toad.
Sleep, profound, with convulſions,	Bite of an aſp.
Sleep, unquiet and troubled, with terrible dreams, ——	Precedes or accompanies the hydrophobia,
Solitude, a fondneſs of, precedes,	ditto.
Speech, a ſtammering in, —	Poiſon of a toad.
Spit at the by-ſtanders, an involuntary inclination to, —	Hydrophobia.
Stomach, ſickneſs great of, with bilious vomiting, —	Cantharides taken inwardly.
Strangury, — ——	ditto.
Sweat, cold, — —— —	Bite of a mad dog.
ditto, — — —	Poiſon of a toad.
Sweat, exceeding cold, —	Sting of a ſcorpion
Swelling, an univerſal, —	Poiſon of a toad.
Teeth, gnaſhing of the, ——	Bite of a mad dog.

Tongue, black, —— —	Poiſon of a toad.
Thoughts, a confuſed ſeries of wild and extravagant,	ditto.
Tongue rough and hanging out,	ditto.
Urine, difficulty of, with a filthy diſcharge, —	Cantharides, &c.
Urine, bloody, — —	ditto.
Voice, hoarſe, — —	Bite of a mad dog.
Vomiting, of a dark bilious viſcid matter, or poraceous bile,	ditto.
Watchings, conſtant, —	Hydrophobia.
Water, ſtarting at the ſight of, with a dread of, and wild looks,	ditto.
Yawning, continual, —	Bite of an aſp.

APPENDIX.

APPENDIX.

AN

ANALYSIS OF COPPER,

AND ITS POISON.

COPPER conſtitutes a diſtinct genus of metals, being next to iron in ſpecific gravity, but lighter than gold, ſilver, or lead. Copper is ſometimes found native, and malleable, both in ſmall and ſlender fibres, and alſo in globular and irregular maſſes. However, it is moſt frequently found in the ſtate of an ore; the ore in this ſtate, as well as lead, is a natural concrete of metals or ſemi-metals, mixed with ſulphur, or arſenic, or both together, and that in a great degree. In the ſtate of ore, copper is ſometimes blended with ſtrata of ſtone, where it diſcovers itſelf in blue or green effloreſcences. The green and blue ochres alſo are ores of copper, and the pyrites and marcaſites frequently contain large quantities of this metal; for in Germany, they extract ſulphur and vitriol from the ſilver marcaſite, which two ſubſtances are always contained in it; and beſides theſe, uſually a quantity of arſenic. There is alſo a rich kind of copper-ore, of a reddiſh-grey colour; and another of a duſky purple, or blackiſh colour. But beſides all theſe, there are two other appearances of copper-ore, known by the names of Lapis Lazuli, and the Turquoiſe ſtone. The firſt, being one of the ores of copper, the baſis of which conſiſts in a cryſtalline matter, coloured with that elegant blue which copper gives to all alkaline liquors. The tincture of this proves a very violent purgative and emetic, owing to the copper it contains. The turquoiſe alſo is a true and genuine ore of copper. That kind, which we uſually diſtinguiſh by the name of the turquoiſe of the old rock, and which Pliny and the antients called Callais, is a true and genuine copper-ore, and is exactly of the ſame kind in regard to this metal, that the hæmatites is to iron; it is found in the perpendicular fiſſures of the ſtrata of ſtone, which contain copper adhering to their ſides in form of a cruſt, and riſing into botryoide effloreſcences, which ſometimes ſtand ſingle, and are in bigneſs from the ſize of a pea to that of a wallnut; but ſometimes happening to be placed cloſe to one another, they join and form flat cruſts or maſſes, extending, in the manner of the cruſts of the hæmatites, to three, four, or more inches in breadth; in theſe the prominent part of every tubercle appearing on the ſurface, the whole ſeems a conjunction of ſemicircular bodies of a fine blue colour, joined by an intermediate ſubſtance of the ſame nature. This kind of turquoiſe is of a very cloſe texture and gloſſy ſurface, but very ſoft, and when broken, ſhews the ſame cruſtated and ſtriated texture as the hæmatites; only that the ſtriæ are uſually finer, and the plates better joined. It ferments with aqua fortis, and may be in great part diſſolved by it; and on calcination loſes all its colour, and becomes of a dirty white. This is produced in Perſia, and ſome other parts of the eaſt. The Germans alſo have a botryoide copper-ore in ſome of their mines; but it is green, and much ſofter than the true turquoiſe of this ſpecies. There is another turquoiſe, which is uſually worne and made up by the jewellers, which is nothing more than the teeth or bones of animals, which have lain in the way of the effluvia of copper, and by this means have acquired veins and ſtreaks of a deep blue, which, on the whole being ſlightly calcined, diffuſe themſelves through all the ſubſtance, and gives it the fine pale blue ſo much admired in this kind of turquoiſes. If the fire that diffuſes this colour be a little too ſtrong, it wholly diſcharges it, and leaves in place of the turquoiſe only a white bone. All theſe prove moſt powerful emetics, and are highly ly dangerous. In order to diſcover whether pyrites contain any copper, let it be calcined in an open fire, and a ſolution made, by pouring upon it a quantity of warm water; into this ſolution let iron plates, perfectly clean and free from greaſe, be immerſed; and if the pyrites contain any copper, it will ſtick to theſe iron plates, in form of a fine yellow powder. As to the method of obtaining copper from the ore, this laſt being previouſly waſhed and powdered, is ſmelted by means of the black flux, and the metal is found at the bottom of the veſſel when cold, in the form of a ſolid, malleable maſs; which may be farther refined, by repeating the operation.

Moſt phyſicians condemn the internal uſe of copper in any form; as all its preparations are poiſonous, in a higher or leſſer degree. But as it acts as a powerful and inſtant emetic, there are ſome who ſtrongly recommend it in caſes of other poiſons, where vomits are highly neceſſary to throw the poiſon up; and ſay, that nothing is more efficacious. It frequently happens that even our food, by ſtanding long in copper veſſels, acquires an emetic quality, which has very bad effects, as will appear in the ſequel.

The preparations of copper are various; but verdigreaſe, the principal one, will ſerve to ſhew the power that acids have on this metal; we ſhall therefore only give the method of preparing verdigreaſe: that ſubſtance is no other than copper, diſſolved by a mild acid into the form of an ærugo, or ruſt.

The proceſs by which verdigreaſe is made is this: after preſſing the grapes for wine, the huſks, ſtones, and other refuſe, are laid to be dried in the ſun; they are then moiſtened with the lees of the ſtrongeſt wine that can be had, and laid together in veſſels till they begin to ferment; after nine or ten days the matter is preſſed, and worked into balls between the hands, and laid in an orderly manner over the bottom of an earthen veſſel, with as much wine as will half cover them. The veſſels are then covered with a looſe lid, and ſet in a cellar, where the balls are left in the wine about fifteen hours, a perſon turning them four or five times in that ſpace, in order to make the wine ſoak perfectly thro' them; after this, ſome wooden bars are placed acroſs the veſſel, about half an inch above the ſurface of the wine, and the balls are laid out of the wine upon theſe; the veſſels are then ſhut up, and the whole left in this ſtate for ten days or more: at the end of this time the balls emit a very penetrating ſcent, and are fit for diſſolving copper.

They are now to be broke to pieces, and the outſide mixed with the internal part, which is moiſter; they are then laid with thin plates of copper, ſtratum ſuper ſtratum, in the ſame veſſels upon the bars, and the whole is left for a week or a fortnight, at the end of which time the plates are found covered with verdigreaſe, which is not to be taken off immediately; but they are wrapped up in cloths wetted in wine, and laid by a week or more, and then the ærugo, or verdigreaſe, is taken off for uſe. This ruſt of copper is ſeldom uſed internally, nor ought it, unleſs in the moſt deſperate caſes, where an inſtantaneous vomiting is neceſſary, as has been already mentioned. Externally, it is a moſt excellent detergent and deſiccative, it eats away fungous fleſh in ulcers, and is one of the beſt remedies yet known for venereal and fungous ulcers, when mixed in a due proportion with yellow baſilicon.

From the powerful effects of vinegar, which corrodes this metal, the utmoſt caution is requir'd; and alſo to ſee that no liquids are let to ſtand in copper veſſels. Fermented liquors from the acid particles that they contain, are obſerved to corrode copper, if ſuffered to remain in them any length of time. Therefore in brewhouſes, perſons ought to be cautious how they let the liquor remain till cold, as in this caſe the volatile parts of the copper impregnate it with the poiſonous qualities of the metal: whence in all brewhouſes, the cleaning the copper ought to be the firſt thing attended to. This caution *Geo. Thwaites*, Eſq; an eminent brewer in Dublin, daily ſaw himſelf duly executed, and rewarded his people conſtantly for keeping the copper veſſels clean ſcowered, which was one principal reaſon of his not having any returns of ale made during a very hot ſummer, although other brewers had great numbers of barrels of ale returned unfit for any other uſe, except that of being ſent to the makers of white lead. To this gentleman's cloſe attention in having his copper veſſels immediately cleaned, and the wort not let to remain in the veſſels longer than was abſolutely neceſſary, to prevent any impregnation of this kind, it was owing that his drink kept longer ſweet, and did not poſſeſs the emetic quality too often found in fermented liquors of this kind.

kind. When the copper is not carefully cleaned before it be uſed, the wort will abſolutely diſſolve the ruſt of it; alſo if any of the wort, be the quantity ever ſo ſmall, is left in the boiler, it becomes acid, and then it ſhews its powerful qualities, by corroding the copper, the conſequence of which is, that it impregnates the liquor afterwards put into the veſſel with poiſonous qualities, which cauſe the aforementioned ſymptoms. From this it ſhews how improper it may be found to have braſs cocks remain in thoſe caſks which contain wine, vinegar, or malt liquors; and I think there ought to be other methods found to draw off liquors; thus let them run from a vent, or, as the common way is, by a wooden ſpigot and faucet, it being ſafe, and will prevent any accident that may happen this way from the uſe of braſs or copper cocks; or ſome compound metal of tin and biſmuth, which is not affected by the vegetable acid, might anſwer the purpoſe.

This metal is diſſolved or rendered ſaline by all acids; and from the above obſervations in the making of verdigreaſe, the vegetable vinous acid, though its action be ſlow, yet diſſolves copper in the greateſt quantity of any, the nitrous acid excepted. Alkaline ſalts, either fixed or volatile, diſſolve it, the firſt in greater quantity, but the latter is the more expeditious and acrimonious. It is likewiſe corroded or diſſolved by all neutral ſalts, both of an acid and alkaline nature.

Copper tea-kettles, &c. when long uſed, highly impregnate the water, and that roughneſs, which is ſo often thought to proceed from the juice of the tea, is nothing more than a corroſive quality or pungency, cauſed by the ſolution of thoſe poiſonous parts of the copper, and theſe being changed by the action of fire into a ſaline ſtate, whereby the moſt poiſonous part incorporates with the water; and to this is owing the whole chain of nervous complaints,

plaints, as is evident, from no ſuch accident attending water uſed for tea, when boiled in an iron or tin tea-kettle. This is further confirmed, as I have known a lady ſubject to a lowneſs of ſpirits, attended with faintings, loſs of appetite, and other nervous complaints, who, on my requeſting of her to make uſe of an iron or tin tea-kettle in future, which ſhe did, was thereby freed from all her former diſorders. I have found tea made with water boiled in an iron or tin tea-kettle, produce effects which many will perhaps diſbelieve, but on trial will be found to be true, viz. ſuch tea taken in a moderate quantity, acts as a gentle aſtringent and corroborative: it ſtrengthens the ſtomach and bowels, and is good againſt nauſeas, indigeſtions, and diarrhæas, and alſo acts as a dieuretic and diaphoretic.

The air reduces copper into a ſaline ſtate, and veſſels that are expoſed thereto, if not kept clean, will contract a blue or green ruſt on their ſurface, which is highly poiſonous; and it is to be obſerved, that the caſters of old lead, which has been long ſubject to the action of the air, is impregnated with a ſaline quality adhering to it, or uniting with it; whence the workers in it find diſagreeable effects, which they do not experience from the working of new lead.

THE EFFECTS OF COPPER.

In whatever ſtate taken internally in the body, it acts as a virulent emetic and cathartic, and if none of theſe evacuations happen it affects the nervous ſyſtem, cauſing convulſions, delirium, ſtupor and head-ach, and ſometimes a mania, with ſymptoms of an inflammation of the brain, or its membranes, and alſo excite violent pains; and if the ſubſtance be not quickly diſcharged, inflammation of the ſtomach, and violent vomiting and purging, difficulty of breathing, ſpaſmodic bowels, contraction of the limbs, and death finally cloſes the ſcene, if the quantity of the poiſon be large. The remedies proper in ſuch caſes are, firſt, to take a great quantity of milk, oil, or melted freſh butter; then to drink warm water till the patient vomits plentifully. Clyſters made with oil, butter, or fat broths, are likewiſe proper, and laſtly ſtrengthening cordials, with a milk diet.

I have ſeveral times remarked (but leſt I ſhould be led aſtray by my own opinion I have queſtioned cooks about this matter) that vegetables, more particularly ſpinage, highly partakes of the quality of the copper, when boiled in ſuch a veſſel, as it occaſions a ſenſe of roughneſs on the tongue, if eaten without butter; and alſo cabbage blackens the water which it is boiled in, and if let to ſtand till cold, cauſes an intolerable ſtench, and at laſt the water changes to a muddy green colour, which will alſo corrode the veſſel. Hence it is apparent, that it is highly neceſſary not to let any thing deſigned for uſe ſtand to cool, or let any thing which turns acid, as milk, to remain long in veſſels of copper or braſs, as ſuch things will infallibly corrode the metal.

Common ſea ſalt powerfully corrodes copper, which is one great reaſon, why ſalt meat ought never to be dreſſed in veſſels of copper, as the conſequence may prove fatal. Butter melted in a copper ſauce-pan becomes alſo highly impregnated with the poiſon, owing to the ſalt which is in the butter; and it is remarkable, that nothing contracts a taſte from a copper veſſel ſooner than melted butter; as ſweet oil ſuffers no ſuch change, it is highly probable, that it is owing either to the action of the ſalt, or to the butter being inclined to rancidity: all earthy ſalts corrode copper very powerfully, eſpecially when aſſiſted by heat.

After what has been here mentioned, it may not be improper to offer ſome particular remarks of my own on copper and lead.

REMARKS.

There is an oily eſſence in copper and lead, which by the air or fire they part with; when this oily principle is deſtroyed, there remains an alkaline ſalt, which then begins to corrode and conſume veſſels made of thoſe metals, and finally makes its way thro' them. This obſervation I find to be confirmed by the leſs perfect metals, and ſemi-metals, melting more eaſily by the addition of ſalts.

This is a convincing proof in reſpect to native gold, which is wholly incapable of ruſt, and which does not ſuffer the accidents, which are common to other metals, being free from the penetrating ſulphurs, &c. which reduce other metals to ores. And the reaſon why ſilver is ſometimes corroded, is owing to its being impregnated with theſe bodies, from which it is extracted, as among the ores of copper, the ore of lead, of cobalt, antimony, &c. It is alſo proper to obſerve, that ſilver is purified by means of lead; for in melting ſilver, copper eaſily mixes with it, which makes it acquire a hardneſs, which renders it more fit for utenſils, than in its pure natural ſtate. It is well known, that lead contains a great part mercury, as alſo does copper, but then the copper does not appear ſo much as it does in the lead.

FINIS.